STATE OF MINNESOTA DISTRICT COURT
COUNTY OF RAMSEY SECOND JUDICIAL DISTRICT

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The State of Minnesota,
by Hubert H. Humphrey, III,
its attorney general,
and
Blue Cross and Blue Shield
of Minnesota,
Plaintiffs,
vs. File No. C1-94-8565
Philip Morris Incorporated, R.J.
Reynolds Tobacco Company, Brown
& Williamson Tobacco Corporation,
B.A.T. Industries P.L.C., Lorillard
Tobacco Company, The American
Tobacco Company, Liggett Group, Inc.,
The Council for Tobacco Research-U.S.A.,
Inc., and The Tobacco Institute, Inc.,
Defendants.

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TRANSCRIPT OF PROCEEDINGS
VOLUME 63, PAGES 12340 - 12573
APRIL 16, 1998

P R O C E E D I N G S.

THE CLERK: All rise. Ramsey County District Court is again in session, the Honorable Kenneth J. Fitzpatrick now presiding.

(Jury enters the courtroom.)

THE CLERK: Please be seated.

THE COURT: Good morning.

(Collective "Good morning.")

THE COURT: Counsel.

MR. BERNICK: Thank you. Good morning, Dr. Appleton.

THE WITNESS: Good morning.

MR. BERNICK: I think I'm getting --

MR. BERNICK: Good morning, ladies and gentlemen.

(Collective "Good morning.")

B. SCOTT APPLETON

called as a witness, being previously sworn, was examined and testified as follows:

REDIRECT EXAMINATION

BY MR. BERNICK:

Q. Dr. Appleton, I want to go back to the ciliastasis test where we began under direct examination. I've put back on demonstrative Exhibit

1452A, and I've also taken us back to the flip chart that we filled out. And I want to ask you a couple questions.

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Did any of the cross-examination that you have heard for the last two days address your testimony on where the ciliastasis test came from, how it got developed?
A. Not that I recall.
Q. Did any of the cross-examination for the last two days address the fact that that standard test was adopted by BATCo for testing purposes?
A. Not that I recall.
Q. Did any of the cross-examination address what it is that BATCo learned from doing the ciliastasis testing?
A. Not that I recall.
Q. If I were to go through the same questions with regard to mouse skin-painting, would your answers be the same or different; that is, was any of your testimony about how mouse skin-painting was developed and what it showed, was any of that even addressed by the cross-examination questions for the last two days?
MR. CIRESI: Objection to the form of the question.

THE COURT: Okay. Sustained.
BY MR. BERNICK:
Q. Could you tell us what portion, if any, of your testimony concerning mouse skin-painting was addressed by the cross-examination?
A. I don't recall -- there --
There was some discussion on some tests I remember that were raised, but I don't recall addressing the history of when the test was developed, how it was used by the scientific community, and BATCo's subsequent adoption of the test as a screen in a product modification program.
Q. Turn the page now to inhalation testing. What portion, if any, of your testimony concerning how that test was developed and implemented and what was learned, what portion, if any, of your testimony along those lines was addressed on the two days of cross-examination?
A. I don't recall, again like skin-painting, I don't recall any discussion or -- about the history of the test, how it was used, what it meant, and how BATCo adopted it in the screens for its product modification program.
Q. And finally with regard to the Ames test, what portion, if any, of the direct examination that you

proffered concerning the origin of that test, the application of that test, and the results of that test, were addressed at all on cross-examination by Mr. Ciresi?
A. None that I recall.
Q. Now you were shown a document relating to the claim a of gentlemen's agreement, this is Trial Exhibit 26229, and you were referred to this portion

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that talks about the alleged gentlemen's agreement. See that?
A. Yes.
Q. Okay. I want to talk with you a little bit about where this research actually got conducted; that is, by whom. First let's talk about in-house research, then contract lab research, and then sponsored research done outside.
The experiments on live animals that you discussed in connection with your testimony about BATCo research, experiments on live animals, were they or were they not done in-house?
MR. CIRESI: Objection as to time, Your Honor, foundation.
THE COURT: Sustained.
Q. Were the experiments done on live animals by BATCo in the inhalation area during the late '70s and

early '80s, were they done in-house?
A. They were done both in-house and in contract laboratories.
Q. Were they also done through outside organizations through sponsored research?
A. I believe some were.
Q. Is that the Harrogate work?
MR. CIRESI: Excuse me, Your Honor, it's leading.
THE COURT: Counsel.
MR. CIRESI: We can have some foundation for this witness's testimony?
MR. BERNICK: Okay.
BY MR. BERNICK:
Q. What if any sponsored research pertained to live animals that you've discussed?
A. Well we did talk about the Harrogate work, which was part of the TRC.
Q. I now want to turn from talking about live animal research to talking about the other kinds of biological research that you discussed. Did you in your direct examination talk about other kinds of live -- other kinds of biological research?
A. Yes.
Q. Okay. Give us some examples.

A. Well primarily the in vitro work, we talked a lot about the Ames test in particular.
Q. Where on this chart; that is, in-house contract or sponsored research, where -- where on this chart was this other biological research done?
A. Most of it was done in-house.
MR. CIRESI: Objection as to foundation, whether that's here in the United States or outside, Your Honor.
THE COURT: Be a little more specific what you're talking about.
Q. Was that done here in the United States, was it done abroad, or both?

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A. It was done in Southhampton's laboratories.
Q. Okay. Was some of it here done in Ames testing?
MR. CIRESI: Excuse me, Your Honor.
THE COURT: Counsel, please do not continue to lead the witness in these areas. Allow the witness to testify, please.
MR. BERNICK: Okay.
BY MR. BERNICK:
Q. What if any in vitro work was done either through sponsored research or contract lab research?
A. Well there's in vitro work done and sponsored in Harrogate. I don't recall in vitro work in the

timeframe that was specified earlier being done in the States. I know it was done in Southampton laboratories at BATCo.
Q. I want you to assume that there's a claim in this case that there was an agreement through the gentlemen's agreement to restrain the development of modified cigarettes by agreeing not to conduct research on live animals in-house domestically. I want you to assume that that's a claim in this case.
A. Okay.
Q. Okay? Is there any difference from a toxicologist's point of view --
What difference, if any, from a toxicologist's point of view is there between conducting research on live animals in-house versus in a contract lab?
MR. CIRESI: Excuse me, doctor. Objection, Your Honor, goes to marketing, outside the scope, and outside the scope of this expert's qualifications.
THE COURT: Well you may answer that.
A. There's no reason to believe there would be any difference in the quality or the nature of the research if it's done in a contract laboratory or in-house. It's very common to do contract lab work.
Q. What difference, if any, does it make from a toxicologist's point of view if research on live

animals is done in the contract lab versus through sponsored research?
A. Again, it makes no difference. What's important is what the protocol is and how the experiment is conducted.
Q. Okay. When the work was done in the in vitro area that you have down as both in-house and through sponsored research, does that or does that not have value in determining the direction of product modification research?
MR. CIRESI: Objection, calls for speculation, conjecture, no foundation.
THE COURT: Sustained.
Q. From the point of view of a toxicologist, what value, if any, does this in vitro work have through sponsored research and in-house research, given the chart that we have here?
A. It has equal value.

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Q. And -- and today, as a toxicologist, which of these two procedures is the more authoritative procedure?
MR. CIRESI: Objection as to time.
THE COURT: Okay.
MR. BERNICK: Today.
THE COURT: No, counsel. Can you rephrase

your question, please.
MR. BERNICK: Okay. As of 1994?
THE COURT: Please.
Q. As of 1994, which of these two procedures was the more authoritative in conducting product modification biological research?
MR. CIRESI: Calls for speculation and conjecture on the part of the witness.
THE COURT: You can answer that.
A. It's hard to say what's more authoritative. Both are important. But the animal work done on live animals had essentially run its course because of the things we discussed last time; there were questions about relevancy. With the inhalation work, the biggest issue was we were simply unable to get lung tumors in animals, and so if you couldn't do that, there was no point in continuing on with that. The in vitro screens are the ones more commonly used now, both within the tobacco industry and outside of the tobacco industry, for product modification research.
MR. CIRESI: Move to strike the portion of the testimony relating to post-'94. There's been no discovery on that, Your Honor.
THE COURT: Sustained.
BY MR. BERNICK:

Q. With regard to pre-1994, would your testimony be the same or different?
A. Yes, it would be the same.
Q. Okay. We talked a little bit about tobacco company research. I now want to talk about published research and I want to direct your attention to Exhibit 3821, which is at volume two, tab 69. It's the 1989 Surgeon General's report at page 38. It's already in evidence.
Are you with me?
A. Yes.
Q. It says, "Since 1967, the U.S. Department of Health and Human Services has transmitted to the U.S. Congress mandated reports on the health consequences of smoking."
MR. CIRESI: May we have a page number, Your Honor?
MR. BERNICK: I said -- I'm sorry, I said at page 38.
Q. "Some of the reports have been encyclopedic reviews similar to the 1964 Report, whereas others have focused on the relationship between smoking and a specific topic. The Federal unit charged with

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preparing these annual reports, the Office on Smoking and Health, now has more than 57,000 documents on

smoking and health in its Technical Information Center database." Do you see that?
A. Yes.
Q. And this is as of 1989?
A. Yes.
Q. What if any -- anything has happened to the growth of scientific literature on smoking and health in your field since 1989?
A. Well there's been a tremendous amount of research in the area. It's accelerating at a very rapid pace. I mean obviously there would be many more scientific reports in the published literature than that at this point; 10 years has transpired since then.
Q. Based upon your understanding and review of the publications and the internal research within the field of toxicology and smoking and health, what do these numbers tell you about who was dominating the research in the field of toxicology, outside scientists or inside scientists?
MR. CIRESI: Well, excuse me. Objection, Your Honor, there's no foundation as to whether he's read these documents.
THE COURT: You'll have to lay a foundation for that.

Q. Based upon your understanding and your review of the internal work, and based upon your reading of the Surgeon General's reports and the collection of published information to the Surgeon General, what conclusion do you draw as a toxicologist on where the bulk of the research in this area was being conducted?
MR. CIRESI: Again, Your Honor, unless he's relating only to Brown & Williamson, there's no foundation. He has not looked at the other defendants' documents.
THE COURT: Okay.
MR. BERNICK: I'll rephrase my question to adopt that comment.
A. Well there's no comparison. I mean the world's published literature on health effects research related to smoking is -- is huge compared to the internal literature in Brown & Williamson.
Q. The state of the art in the field of toxicology; that is, the developing science in that field in smoking and health, where did the state of the art evolve? Did it evolve in-house, or did it evolve in the published scientific research?
MR. CIRESI: Your Honor, there's no foundation for that.

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THE COURT: You'll have to lay a foundation for that.
Q. In your field of toxicology, have you testified to the jury about the test procedures that were used in doing toxicological research at that time?
A. Yes, I did.
Q. Where did the state of the art on those test procedures develop? Did they develop internally at BATCo or did they develop externally in the published research?
A. Well they initially developed externally in the published literature and then were adopted by BATCo.
Q. I now want to talk a little bit about reviews. You were shown a review --
Or let me ask it this way: You were asked on cross-examination about a textbook called Casarett & Doull?
A. Yes.
Q. Holding it up here, it's a big thick text; is it not?
A. Yes.
Q. Is that original research, or is this a review text; that is, a compilation of research done by others?
A. It's a compilation of research done by others.

Q. Now this is called "TOXICOLOGY: THE BASIC SCIENCE OF POISONS." Is this a review text that is focused specifically on smoking and health, or is it a more general review text on toxicology?
A. It's a more general review text; covers many, many areas.
Q. Is this the authoritative review of the published literature on smoking and health in the field of toxicology, or are there other more authoritative reviews in that specific field?
MR. CIRESI: It's -- objection, Your Honor, relevancy.
THE COURT: No, you can answer that.
A. I would not regard that as the authoritative review that one would consult if they wanted to learn about the health effects of smoking.
Q. What would be a more authoritative review concerning the field of toxicology and smoking and health specifically?
A. Well the Surgeon General's reports.
Q. Now based upon your review of the Surgeon General's reports, what function or what role, if any, did they play in conducting a review of the existing published literature?
A. Well they -- they assembled the literature and

they summarized it, and from that made a number of conclusions and recommendations.
Q. Okay. You were asked on cross-examination questions about smoking and health policy. Do you

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recall that?
A. Yes.
Q. What role, if any, do you see from the Surgeon General's reports themselves, what role if any did you see that the Surgeon General played in the development of policy?
A. They played a very prominent role.
Q. And what was that role?
A. Again, they summarized the literature, they analyzed it, they drew a conclusion, and they made a number of recommendations concerning smoking and health and public policy concerning smoking.
Q. So as a review of the literature, they analyze it and they develop policy?
A. Yes.
Q. Okay. I want to turn your attention to the 1981 Surgeon General's report in particular, which is Exhibit TG000237. It's tab 51 of volume two.
THE COURT: May we have a page, please?
MR. BERNICK: I'm sorry. Yes, Your Honor. It's -- it's going to be the preface. That's at page

little v and little vi.
Q. Now do you recall that Mr. Ciresi directed your attention to some of the findings in this report?
A. Yes.
Q. I want you to take a look at the prior page. Do you see that on the prior page there is a discussion, just before the findings, that begins, "In this 1981 Report, the Public Health Service has reviewed the question again and in far greater depth than before. Overall, our judgment is unchanged from that of 1966 and 1979: smokers who are unwilling or as yet unable to quit are well advised to switch to cigarettes yielding less 'tar' and nicotine, provided they do not increase their smoking or change their smoking in other ways. But our new review raises new questions and suggests an even more cautious approach to this issue." Do you see that?
A. Yes.
Q. Is that or is that not an example of what you described as policy being developed by the Surgeon General?
MR. CIRESI: Objection, Your Honor, it's leading and suggestive.
THE COURT: You can answer that.
A. Well yes, that's -- that's exactly what I was

referring to.
Q. Now you were also asked questions about communication with consumers. Do you recall that?
A. Yes.
Q. Have you determined, from the Surgeon General's reports, whether there was a communication function associated with the Surgeon General's reports?
A. Well yes. The reports -- that --
That's their whole role, is to communicate

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information.
Q. I want to direct your attention to Exhibit 3821, which is Plaintiffs' Exhibit 3821, it's at tab 66, volume two, it's the 1989 Surgeon General's report, and I'm going to be asking you questions about the preface there which appears at little iii and little iv.
A. This is in plaintiffs' exhibits? It will be in these volumes down here?
Q. It will be in volume two, tab 66, I hope.
MR. CIRESI: That's in the defendants' books, doctor.
MR. BERNICK: It's in -- yeah, in the --
THE WITNESS: Okay. Volume two?
MR. BERNICK: Yes.
THE WITNESS: Tab 66?

MR. BERNICK: Yes.
THE WITNESS: Well I must have the wrong thing. That's obviously not it. I'll just follow the screen.
MR. BERNICK: May I approach, Your Honor?
Thank you.
(Document handed to the witness.)
Q. Not the easiest thing in the world to read. Let me begin right here. It says, "Exactly 25 years ago, on January 11, 1964, Luther L. Terry, M.D., Surgeon General of the U.S. Public Health Service, released the Report of the Surgeon General's Advisory Committee on Smoking and Health."
That would have been the first Surgeon General's report; is that right?
A. That's correct.
Q. "That landmark document, now referred to as the first Surgeon General's Report on Smoking and Health, was America's first widely publicized official recognition that cigarette smoking is a cause of cancer and other serious diseases."
Does that or does that not refer to the communication function of the '64 Surgeon General's report?
A. I believe it does.

Q. "On the basis of more than 7,000 articles relating to smoking and disease already available at that time in the biomedical literature, the Advisory Committee concluded that cigarette smoking is a cause of lung cancer and laryngeal cancer in men, a probable cause of lung cancer in women, and the most important cause of chronic bronchitis. The Committee stated that 'Cigarette smoking is a' -- that 'Cigarette smoking is a health hazard of sufficient importance in the United States to warrant an appropriate remedial reaction.'"
"What would constitute 'appropriate remedial action' was left unspecified. But the release of the report was the first in a series of steps, still

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being taken 25 years later, to diminish the impact of tobacco use on the health of the American people."

Now the 1989 report was the 25th anniversary after the '64 report; is that right?

A. That's right.

Q. Let's continue on for a moment here.

"This 1989 Report, the 20th in a series of Surgeon General's Reports on the Health Consequences of Smoking, spells out the dramatic progress that has been achieved in the past quarter century against one of our deadliest risks."

Between the time of the 1964 report and this 1989 report, were there other Surgeon General reports that were issued in the interim?

A. Well as it says in the preface here, this was the 20th report.

Q. "The circumstances surrounding the release of the first report in 1964 are worth remembering. The date chosen was a Saturday morning, to guard against a precipitous reaction on Wall Street. An auditorium in the State Department was selected because its security could be assured - it had been the site for press conferences of the late President John F. Kennedy, whose assasination had occurred less than 2 months earlier.

"The first two copies of the 387-page, brown-covered report were hand delivered to the West Wing of the White House at 7:30 on that Saturday morning. At 9:00 o'clock, accredited press representatives were admitted to the auditorium and 'locked in' without access to telephones. Surgeon General Terry and his Advisory Committee took their seats on the platform. The Report was distributed and reporters were allowed 90 minutes to read it. Questions were answered by Dr. Terry and his Committee members. Finally, the doors were opened

and the news was spread. For several days, the Report furnished newspaper headlines across the country and lead stories on television newscasts. Later it was ranked among the top news stories of 1964."

Does the report then go on to describe what's happened in the interim period of time?

A. Yes.

Q. "During the quarter century that has elapsed since that Report, individual citizens, private organizations, public agencies, and elected officials have tirelessly pursued the Advisory Committee's call for 'appropriate remedial action.' Early on, the U.S. Congress adopted the Federal Cigarette Labeling and Advertising Act of 1965...."

(Drawing on flip chart) Supposed to be a little cigarette pack there. Cigarette packs since 1966 have carried a warning; is that right?

A. That's correct.

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Q. And that warning is -- what is it? It's called the Surgeon General's warning?
A. Yes.
Q. Is that what's being discussed here with this act that was passed in 1965?
A. Yes.

Q. Does that warning --
Has that warning appeared on every pack of cigarettes sold here in the United States since that time?
A. Yes, it has.
Q. Goes on to include --
MR. BERNICK: Let me just read over, Your Honor, so the record is complete.
Q. "...and the Public Cigarette Smoking Act of 1969. These laws required a health warning on cigarette packages, banned cigarette advertising in the broadcast media, and called for an annual report on the health consequences of smoking."
Those were the Surgeon General reports?
A. Yes.
Q. "In 1964, the Public Health Service established a small unit called the National Clearinghouse for Smoking and Health (NCSH). Through the years, the Clearinghouse and its successor organization, the Office on Smoking and Health, have been responsible for the 20 reports on the health consequences of smoking previously mentioned, eight of which have been issued during my tenure as Surgeon General. In close cooperation with voluntary health organizations, the Public Health Service has

supported highly successful school and community programs on smoking and health, has disseminated research findings related to tobacco use, and has ensured the continued public visibility of anti-smoking messages."
Are these or are these not other activities of the Public Health Service designed to educate consumers?
A. Well they're obviously designed to educate consumers.
Q. What about the doctors, are they also audiences to this process?
A. Yes, of course.
Q. "Throughout this period, tremendous changes have occurred. As detailed in this report, we have witnessed expansion in the scientific knowledge of the health hazards of smoking, growing public knowledge of the dangers of smoking, increased availability of programs to prevent young people from starting to smoking and to help smokers quit, and widespread adoption of policies that discourage the use of tobacco." See that?
A. Yes.
Q. Does the report then go on to describe what has

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happened to views about smoking as a result?

A. Yes, it does.
Q. "Most important, these developments have changed the way in which our society views smoking. In the 1940s and 1950s, smoking was chic; now, increasingly, it is shunned. Movie stars, sports heroes, and other celebrities used to appear in cigarette advertisements. Today, actors, athletes, public figures, and political candidates are rarely seen smoking. The ashtray is following the spittoon into oblivion.

"With this -- Within this evolving social milieu, the population has been giving up smoking in increasing numbers. Nearly half of all living adults who have ever smoked have quit. The most impressing decline in smoking has occurred among men. Smoking prevalence among men has fallen from 50 percent in 1965 to 32 percent in 1987. These changes represent nothing less than a revolution in behavior.

"The anti-smoking campaign has been a major public health success. Those who have participated in this campaign can take tremendous pride in the progress that has been made.

"The analysis in this report shows that in the absence of the campaign, there would have been 91 million American smokers (15 to 84 years of age) in

1985 instead of 56 million. As a result of he decisions to quit smoking or not to start, an estimated 789,000 smoking-related deaths were avoided or postponed between 1964 and 1985."

THE COURT: Counsel, --
MR. BERNICK: Yes.
THE COURT: -- this is already an exhibit. Are you going to read the whole document?
MR. BERNICK: I'm almost at the end. I'm sorry, Your Honor.

Q. "Furthermore, these decisions will result in the avoidance or postponement of an estimated 2.1 million smoking-related deaths between 1986 and the year 2000.

"This achievement has few parallels in the history of public health. It was accomplished despite the addictive nature of tobacco and the powerful economic forces promoting its use."

In this 25-year report, does the Surgeon General or does he not describe what has happened as a result of the activities of public health authorities and people working with public health authorities regarding health policy and smoking and health?
A. Yes, he does.
Q. I want you to assume that there has been placed

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in evidence --
Let me pull one other factor out of this. The jury's been shown, you were shown on cross-examination, Trial Exhibit 18989, which is a JAMA paper. It says it's an editorial.
A. Yes.
Q. Is there a difference between peer-reviewed research and editorials which appear in journals?
A. Well yes. Research is the process that one tries to test hypotheses by setting up experiments, doing tests, gathering data, and reporting the data and drawing conclusions. Editorials are opinions.
Q. Okay. And this particular editorial says right here what its purpose is. "We hope that publication of the articles will encourage all our readers to become even more active in the campaign against tobacco."
Dr. Appleton, for how long have doctors issued editorials campaigning against tobacco use?
MR. CIRESI: Objection, foundation, Your Honor.
THE COURT: You'll have to lay a foundation for that.
Q. Are you familiar with published literature going back into the 1950s relating to editorials or

statements against the use of tobacco?
A. Yes, I am.
Q. We talked about Reader's Digest. Would that be an example of that?
MR. CIRESI: Well, Your Honor, could we let the witness testify as to what they are?
THE COURT: Yes. Let the witness testify, please.
MR. BERNICK: Okay.
BY MR. BERNICK:
Q. What if any role did Reader's Digest play in this editorial process?
A. Well Reader's Digest was obviously widely read by the public and included a lot of articles about the health effects of smoking.
Q. I want you to assume that there's been evidence in this case that by May 4 of 1970, polls conducted in the state of Minnesota showed that 95 percent of people asked have stated that their impression was that cigarette smoking was in fact a health hazard. I want you to assume that that's in evidence in the case.
MR. CIRESI: Your Honor, then he's also going to have to assume they were not entered for the truth or falsity. It's a misstatement of the

evidence.
THE COURT: The objection is sustained.
BY MR. BERNICK:
Q. I want you to assume, Dr. Appleton, that they were -- they were admitted for purposes of notice.

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Okay?
A. Okay.
Q. And notice only.
Is that or is that not inconsistent with what you've described in connection with the communication efforts that are displayed on this chart?
MR. CIRESI: Objection, Your Honor, calls for speculation on the part of this witness. We don't know what he's referring to, what underlying document.
MR. BERNICK: Well I'm referring to Exhibit BYB000196 and the testimony that was offered in connection with it.
THE COURT: Would you care to have me rule on the objection, counsel?
MR. BERNICK: Oh, I'm sorry.
THE COURT: Overruled.
A. Well the preface here describes the extensive campaign to educate the public and doctors about the dangers of smoking, and apparently a poll in 1970

suggesting that 95 percent of citizens of Minnesota feel that smoking is a health hazard indicates that the message has gotten through.
MR. CIRESI: Move to strike.
THE COURT: Okay. It's non-responsive.
Q. Dr. Appleton, the fact that it was said in 1970, said for notice purposes, that 95 percent of Minnesotans interviewed believed that smoking was a health hazard, is that consistent or inconsistent with the efforts that are reflected by public health organizations?
MR. CIRESI: Objection, Your Honor, calls for the truth or falsity of the poll.
THE COURT: It calls for the truth or falsity of the poll, counsel.
MR. BERNICK: Let me see if I can rephrase the question so it's not --
That's not the intent, Your Honor. I understand the point.
Q. Dr. Appleton, as campaigns are mounted, as you have indicated, pursuant to the Surgeon General's reports, would you or would you not expect that statements would be made, would be made, in fact, regarding, in a polling process, people's attitudes on smoking and health?

MR. CIRESI: Excuse me. Objection, Your Honor. This is a toxicologist. He's not offered as another type of expert.
MR. BERNICK: Your Honor, he was asked specifically about communications with consumers.
MR. CIRESI: He was asked about one document that related to the fact that the industry said they wanted to get the information to the public.
THE COURT: Okay. You're kind of getting

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beyond his area of expertise.
MR. BERNICK: I'll push on, Your Honor. That's fine.
BY MR. BERNICK:
Q. I'd like to ask you some questions now in another area. I want to talk to you a little bit about lawyers and research, and I want to go through the areas of research that you described in connection with BATCo research beginning with mouse skin-painting.
Have you seen, in the documents that were shown you on cross-examination, concern by lawyers over the fact that mouse skin-painting research was going to get conducted?
A. Yes.

Q. Directing your attention to Exhibit 26194, which is in evidence, that's the October 8, 19 --
MR. BERNICK: I'm sorry, counsel, this is Plaintiffs' Exhibit 26194, volume one, tab 28. It's a letter dated October 8, 1965, memo to Mr. Finch.
THE WITNESS: Yes.
Q. Do we see there that in 1965 -- if I can get it right here -- concern was being expressed about the work at Harrogate, and in particular with -- you see it -- "As you know, Harrogate has been very active in testing biological activity of smoke condensate" -- woop, sorry, there we go -- "smoke condensate on the shaven backs of mice." Is that mouse skin-painting work?
A. Yes.
Q. And lawyers are concerned about the mouse skin-painting work?
A. Yes.
Q. After 1965 was there or was there not mouse skin-painting work that actually got done?
A. Well yes, a lot of work got done.
Q. After 1965 what mouse skin-painting work got done even though the lawyers were concerned about it?
A. Well the particular study that is the topic of this memo was completed and was published, and that

was the work done at Harrogate. And then the whole JANUS program, which is BATCo's -- one of their efforts at developing a safe cigarette, that employed the mouse skin-painting test as a screen, that was done. And this is a depiction of the timetable and the various tests and the various cigarette design parameters that were measured or assessed in this program.
Q. Okay. Showing you demonstrative Exhibit 0849, which is at volume one, tab 14, was this again the mouse skin-painting that was done under contract with BATCo?
A. Yes.
Q. And was that, again, done beginning in 1967, even after the lawyers expressed their concerns?

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A. Yes.
Q. Let's talk about inhalation research. There was reference made to the fact --
Well let me just get some background here. Inhalation research at BATCo in the late '70s and early 1980s, where was that done?
A. Primarily in-house. Some was contracted out.
Q. Now showing you Plaintiffs' Exhibit 11946, which was shown you on cross-examination, do you recall that that related to --

It's a 1985 document relating to tobacco research and B.A.T Industries?
A. Yes.
Q. And there was a reference that was made and you were directed to page -- I don't know if it has a page number -- ends 607 at the bottom right-hand corner, and this particular paragraph here. It says, "All in-house animal work will cease and future studies involving animals will be done externally under contract."
Now at that time, that is, in 1985, was the in-house facility shut down at Southampton?
A. Well the inhalation research part of it was terminated, yes.
Q. What happened to the rest of it?
A. It remained there and remains there today.
Q. Okay. And the inhalation work, what had happened to the progress of research in the inhalation area prior to the time that the lab was shut down?
A. Well at that point we tested all the parameters that we could think of that -- that may be responsive and --
MR. CIRESI: Excuse me, Your Honor --
A. -- we got no productive results, and so it had

run its course.
THE COURT: Sir --
THE WITNESS: I'm sorry, I was completing my answer.
THE COURT: Sir, --
THE WITNESS: I'm sorry, Your Honor.
THE COURT: -- if the attorney stands up to make an objection, allow him to make the objection, please.
MR. CIRESI: Objection, no foundation.
THE COURT: Sustained.
Q. Based upon your review of the inhalation work and the inhalation reports done at BATCo, what if any relationship does this decision have on the work that was underway?
MR. CIRESI: Same objection.
THE COURT: Sustained.
Q. Dr. Appleton, did you review the inhalation work that was done at BATCo during this period of time?
A. Yes.

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Q. Okay. And could you tell us the status of the inhalation work that was done at BATCo as of this point in time?
A. Yes. Many studies had been done. A lot of cigarette design parameters had been tested and

measured for their influence in this particular test. Ultimately the test didn't give any clear indication of which cigarette product designs would be beneficial. I mean ultimately we were unable to produce lung tumors, so in essence the project had run its course and came to a natural conclusion.
Q. And what had the Surgeon General concluded about inhalation research as of 1982, three years before this document?
A. Well that, in essence, despite many attempts and many species, that human-lung-type cancer could not be produced in animal studies by the inhalation route.
Q. Let's talk about Ames tests. Were you shown on cross-examination documents that indicated that lawyers were concerned with Ames testing?
A. Yes.
Q. I want to direct your attention to volume one, be tab 15, it's Plaintiffs' Exhibit 26204.
MR. BERNICK: And Your Honor, I need to approach very briefly on side-bar concerning a question before displaying this.

(Side-bar discussion as follows:)

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(Side-bar discussion concluded.)

BY MR. BERNICK:

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Q. Are you with me on the exhibit, Dr. Appleton?
A. Is it the one we have up here on the screen?
Q. No. This is at volume one, tab 15. It's 26204.
A. Okay. Of which notebook?
Q. That is volume one, tab 15. I guess it's one of ours.
A. I'm sorry, on redirect, on the redirect notebooks?
Q. Yes.
A. Tab 15?
Q. Yes.
A. There we go.
My tab doesn't match up with what's on the screen. I think you have to take care of that at the break.
Q. Okay. But let's look at the screen.
Do you see that this is one of the memos that was shown to you on cross-examination? It's from Mr. Wells and it's dated in June of '84, and it relates to a conference with B.A.T legal on U.S. product-liability litigation?
A. Yes.
Q. Okay. And directing your attention to the second page, do you see that there is a discussion

about Project RIO? I think it begins up here.
"We were able to hold significant discussions about -- about implications for U.S. products liability litigation only regarding Project Rio."
A. Yes.
Q. Okay. Project RIO, was Project RIO --
What type of assay was going to be used in Project RIO?
A. The Ames assay. The in vitro mutagenicity test that we talked about earlier was the main biological test used to screen different variables and different products.
Q. Now there's reference in this document a little bit later on to the fact -- I think it's right here -- "Direct lawyer involvement is needed in all BAT activities pertaining to smoking and health from conception through every step of the activity." Do you see that?
A. Yes.
Q. Do you see whether any recommendation ever came out of this discussion in this document?
A. No.
Q. It says, "The problem posed by BAT scientists and frequently used consultants who believe cause is proven is difficult. A sound recommendation must be

based upon consideration of several factors, including the basis upon which senior management relies in concluding that the opinion of the scientist is incorrect; the overall reliance of senior management on the opinions of the scientist; the responsibilities assigned to the scientist; and

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the company's duty to encourage scientific inquiry."
It goes on to say, "Conclusions about recommendations for the structuring and handling of BAT statements and programs can be made only after a comprehensive review of the facts. Not enough facts are known to propose conclusions at this point and fact gathering would be an important immediate requirement for the development of lawyer recommendations."
Were recommendations actually made and reflected in this document?
A. No.
Q. Do you know whether Project RIO work ultimately got done?
A. Yes, it did.
Q. I want to direct your attention to Exhibit GSP000043, which is at volume one, tab 16.
A. Of whose notebook? Is that ours?
Q. I guess.

A. Okay.
Q. Should be.
A. Yes, I see it.
Q. And am I now displaying the first page of this report?
A. Yes.
Q. And this reflects that it's dated 1987. That's three years after the Wells memo?
A. Yes.
Q. And is this in fact a Project RIO summary report?
A. Yes, it is.
Q. And over in the upper right-hand corner, what does that reflect?
A. That B&W's library received this on March 10, 1987.
Q. Directing your attention to Trial Exhibit 13503, is this yet another report relating to Ames testing?
A. Yes, it is.
Q. And does this report include U.S. as well as European commercial cigarettes?
A. Yes, it does.
Q. The date of this one is what?
A. This one is February 18th, 1988, about a year after this one -- this previous report.

Q. And what if anything can you devine from the stamp in the upper right-hand corner?
A. Well again it indicates that the B&W library received it.
Q. Directing your attention to page two, is there a table that appears here?
A. Yes.
Q. Okay. And again, are U.S. brands included?
A. Yes, they are.
Q. I want to move from the conduct of research to drafting research reports and articles for a moment.

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Was there reference made in some of the documents that were shown you on cross-examination, was there a reference made to concern over the content of published reports?
A. Yes.
Q. Directing your attention to Trial Exhibit 26228, do you recall that this was a letter in February of 1986 relating to the Harrogate work?
A. Yes.
Q. And do you recall that this was the document that made reference to "To reassure you" -- this is kind of in the middle, beginning here, "To reassure you, I have no intention of agitating the question, but the difference existing, we would hope to be

afforded the opportunity of consulting with the people on your side concerning the way Harrogate's work is presented, admittedly with the hope of 'slanting' the report." Do you see that?
A. Yes.
Q. Have you examined the publication that actually resulted from the Harrogate research on mouse skin-painting?
A. Yes, I have.
Q. Directing your attention to volume one, tab 30, which is Exhibit GS000004, is that a publication that appeared in the British Journal of Cancer --
A. Yes.
Q. -- in March 1967?
A. Yes.
Q. Is that a peer-reviewed journal?
A. Yes, it is.
Q. Okay. Does this relate to the work that was done at Harrogate on mouse skin-painting?
A. Yes. This is the study --
Q. Okay.
A. -- that was referred to in this memo.
Q. Have you relied upon this in connection with forming your views in this case?
A. Yes.

Q. And this is a reliable authority within your field?
A. Yes.
MR. BERNICK: We offer it, Your Honor, as a learned treatise.
MR. CIRESI: No objection, Your Honor.
THE COURT: It will be received into evidence.
BY MR. BERNICK:
Q. Is that the first page of the document?
A. Well that's the cover page of the journal.
Q. Okay. And does this reflect, you know, where and when it was published?
A. Yes.
Q. Okay. Directing your attention to the first page, does this reflect the subject matter of the

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publication?
A. Yes.
Q. And this is done, it says, by T. D. Day, and he's from The Tobacco Research Council Laboratories, Harrogate. Is that the same Harrogate that we've been talking about?
A. Yes.
Q. And is this a mouse skin-painting study?
A. Yes, it is.

Q. Directing your attention to the bottom of the page, does this reflect at the very -- I guess it's the -- four, five lines up, beginning right here, what the general aim of the work was?
A. Yes.
Q. And what was the general aim of the work?
A. Well it was basically to compare condensates prepared in two different ways. One was what they called instant condensate; namely, if they collected the smoke and immediately applied that to the test animal, and compared that activity with smoke that had been collected, stored, and then held for some period of time, some period of weeks, to see if there is any difference between fresh condensate versus older and stored condensate.
Q. And what were the results of the study as reported in the article?
A. The report showed that -- that they were comparable. If anything, the fresh condensate may have had slightly greater activity in this particular test.
Q. Going to the summary that appears at page 69, does this paragraph capture the overall conclusion that was reached?
A. Yes. Also reminds me, they -- they did test for

another parameter, too. They looked at -- they fractionated the smoke condensate into various fractions, and they also tested them to see which fraction had the greatest activity, and they're here talking about the non-volatile, neutral fraction of cigarette smoke condensate.
Q. Okay. With regard to the activity of this condensate in mouse skin-painting, was the conclusion reported here favorable or unfavorable to tobacco and cigarettes, given this particular bioassay?
A. Well the overall conclusion was that condensate produces cancer in this test, which was comparable to what had previously been reported, but the fresh versus older condensate was -- was not favorable. There -- there was a hypothesis that perhaps what had been seen in these skin-painting tests reflected what may have been an artifact that occurred when the condensate was held, there may have been chemical reactions that occurred, and there was a theory that perhaps fresh condensate wouldn't have that activity. In this case it was found to in fact have the

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activity, essentially undermining that hypothesis or disproving that hypothesis, and that's what they found and that's what they reported.
Q. Now I want to turn from talking about the

reporting of research to the distribution of research.
You testified on direct examination that Brown & Williamson has received 700 BATCo R&D reports during the period 1980 to 1993. Do you recall your testimony?
A. Yes.
Q. Now you were shown --
Let me just get some other dates up here.
And are there approximately 10 additional reports that were shown as being sent to Brown & Williamson but Brown & Williamson doesn't have in its files?
A. Yes.
Q. Okay. Now you were shown on cross-examination Exhibit 11180, which is a January 10, 1985 letter from Pritchard to Hardwick. Do you recall that?
A. Yes.
THE WITNESS: Counsel, can I ask you something?
MR. BERNICK: Sure.
THE WITNESS: If you're starting a new area, this is normally break time. Is there a chance we can do that?
MR. BERNICK: Well okay. The court would

like to take us up to 10:45.
THE WITNESS: Okay.
MR. BERNICK: Is that correct? I'm sorry, I didn't tell you that.
THE WITNESS: All right. Because I have to go to the bathroom. Sorry.
(Laughter.)
THE COURT: I believe there's an article in the paper about this --
(Laughter.)
THE WITNESS: Sorry.
THE COURT: -- where the employers wouldn't let the people go to the bathroom.
Court will recess.
THE CLERK: Court stands in recess.
(Recess taken.)
THE CLERK: All rise. Court is again in session.
(Jury enters the courtroom.)
THE CLERK: Please be seated.
THE COURT: Counsel.
MR. BERNICK: Thank you, Your Honor.
BY MR. BERNICK:
Q. Dr. Appleton, when we broke we were talking about the distribution of BATCo R&D reports to Brown

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& Williamson. Do you recall that?
A. Yes.
Q. And we have up on the screen one of the documents that was shown you on cross-examination, which was a letter from Mr. Pritchard to Mr. Hardwick dated January 10 of 1985. Do you recall that?
A. Yes.
Q. And is this the letter that talks about distributing -- the distribution emanating from GR&DC --
That's the research and development part of BATCo?
A. Yes.
Q. -- should be sent to this lawyer in Louisville. Do you recall that?
A. Yes.
Q. And this is January 10 of 1985.
I want to direct your attention now to another document, which is at tab 7A of volume one, it is GM000079.
A. Tab -- which tab?
Q. Volume one, tab 7A.
A. 7A. Got it.
Q. You see that this is a memo from Mr. Kohnhorst to Dr. Esterle?

A. Yes.
Q. And it's a Brown & Williamson internal memo?
A. Yes.
Q. Is this the type of memo generated in the ordinary course of business on maintained in the ordinary course of business by Brown & Williamson?
A. Yes.
MR. BERNICK: We offer it as a business record.
MR. CIRESI: No objection, Your Honor.
THE COURT: Court will receive GM000079.
BY MR. BERNICK:
Q. Now this memo, it says that "The procedure for receiving external reports from the Research Centers has been changed. In the future, two copies of each report will come directly to me. One copy will be forwarded to you -- directly to you for your prompt review. You should pay particular attention to any sensitive issues and, in those cases where you have concerns, you should review with Mr. Kendrick Wells prior to submission to the library system. In addition, please call my attention to any reports you feel should not be held in the library."
That's from Mr. Kohnhorst; right?
A. Yes.

Q. And this is April 1985, which is four months later?

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A. Yes.
Q. And there's no mention made any more of circulating them to Mr. Maddox; is that correct?
MR. CIRESI: Well objection, Your Honor, that calls for rank speculation on the part of this witness.
THE COURT: And it is leading, counsel.
MR. BERNICK: Okay.
Q. What if any mention do you see in this memo of routing the documents to Mr. Maddox?
THE COURT: Still leading, counsel.
MR. BERNICK: I'm sorry, Your Honor.
THE COURT: It's still leading.
MR. BERNICK: Okay.
Q. Who is Mr. Kohnhorst?
A. He's a senior executive with Brown & Williamson. At some period of time he was the head of R&D, it may have been this time, but I'm not exactly sure of what his tenure was and when he was.
Q. Now if we take this period of time of January 10, 1985 to April 19 of 1985, and bear that in mind for a moment, have you taken a look at the ten reports which were issued from BATCo R&D to B&W but

which have not been found at B&W, have you looked -- have you looked at them?
MR. CIRESI: May we have some foundation as to when, Your Honor?
THE COURT: All right.
Q. Have you examined those documents in connection with your work in this case, Dr. Appleton?
A. Yes, I have.
Q. Okay. And can you tell us whether any of those 10 reports, which didn't make their way to Brown & Williamson, were issued during the period of time between the date of the January 10 memo and this memo saying send it to Kohnhorst?
MR. CIRESI: Well objection, calls for facts unknown to this witness and also whether other reports were being sent to Mr. Pritchard or to the lawyers in Louisville.
THE COURT: No, I think you can answer that.
A. No, none of the 10 reports I looked at -- I checked the dates against this time period, and none of the reports, the dates of issuance, fell into this time period.
Q. These 10 reports that were referring to that didn't make their way to Brown & Williamson --

MR. CIRESI: Excuse me, Your Honor. May we have a foundation as to when he did that, in light of the document that was just introduced?
THE COURT: You want to give us some time parameters?
MR. BERNICK: Yeah.
BY MR. BERNICK:

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Q. Dr. Appleton, when did you read these 10 reports?
A. Approximately three weeks ago.
Q. Okay. And when you read those three reports, did those reports fall into any particular time during this period?
A. No. They spanned a range of time periods.
Q. Did those reports pertain to any particular subject matter?
A. No, they -- they essentially spanned the subject matter of areas that are being researched at the Research Center in Southampton.
Q. What if any pattern did you see in these 10 reports?
A. There was no pattern.
Q. I want to talk now a little bit about the storage and preservation of documents, and I want to direct your attention to volume one, tab four, and

Exhibit GM000005.
A. I see it.
Q. Okay. Is this a memo dated Jan -- June -- June 15, 1983, from Mr. Wells to a variety of people?
A. Yes, it is.
Q. Okay. Is this a memo generated and maintained in the ordinary course of business at Brown & Williamson?
A. Yes.
MR. BERNICK: We offer it as a business record.
MR. CIRESI: No objection, Your Honor.
THE COURT: The court will receive GM000005.
BY MR. BERNICK:
Q. See this is another memo from Mr. Wells to Mr. Pepples?
A. Yes.
Q. And do you see where it says, in the first paragraph, that "As you know, in preparation for our move to the B&W Tower all departments have been asked to reduce in-department file storage requirements for the Tower to the greatest possible extent, with a minimum reduction of 50 percent. The presumption favors discarding removed files. However, due to

B&W's status as a defendant in several pending lawsuits we must retain certain categories of documents. As a party to these lawsuits, B&W may be ordered to divulge to opposing parties any information they request which is directly or indirectly relevant to the subject matter and in Brown & Williamson's -- B&W's possession or control. When a lawsuit is filed B&W has a duty to preserve relevant materials from that time forward until the action terminates."
Do you see that?
A. Yes, I do.

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Q. Now I then want to direct your attention -- This is in June of 1983?
A. Yes.
Q. I now want to turn to Trial Exhibit 2485, which was introduced by the state, and it's at tab one, volume one. And this is Mr. Wells' memo where he talks about certain documents being deadwood.
A. Yes.
Q. Okay. So this -- this memo is January 1985. We'll call it the deadwood memo. That's about 18 months after the memo that we just looked at about preserving documents?
A. Yes.

Q. Now this makes reference during the course of the memo to "I gave Earl copies of papers which contained, variously, document numbers and titles, and document numbers and abstracts. I explained I had marked certain of the document references with an X. The X designated documents which I suggested were deadwood in the behavioral and biological studies area. I said that the 'B' series are 'Janus' series studies and should be considered deadwood."
Do you know what role, if any, scientists at Brown & Williamson played in the process of identifying these documents?
MR. CIRESI: Objection, Your Honor, foundation.
THE COURT: Sustained.
MR. BERNICK: Well I -- I'll rephrase the question.
Q. Do you have any knowledge, Dr. Appleton, regarding what role, if any, scientists played in this process?
A. Well this document mentioned --
MR. CIRESI: Well that calls for a "yes" or "no," Your Honor.
Q. Beyond what you read in the document, do you have your any own -- do you have your own personal

knowledge of that?
A. Yes.
Q. Okay. What is that?
A. Well he worked, apparently, with Mr. Kohnhorst here.
MR. CIRESI: Well objection, Your Honor. There's no foundation as to what this witness knows.
Q. Well Dr. Appleton, does the memo mention Earl Kohnhorst?
A. Yes, it does.
Q. And who is Earl Kohnhorst?
A. At one point he was the head of R&D.
Q. Okay.
A. He may have been at this particular time period.
Q. Now I then want you to turn to the next page. "I suggested that Earl have the documents indicated on my list pulled, put into boxes, and stored in the

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large basement storage area." Do you see that?
A. Yes.
Q. At the time that you joined Brown & Williamson, what year was that?
A. 1991.
Q. And did you locate these documents in storage at Brown & Williamson?
MR. CIRESI: Objection, Your Honor, there's

no foundation as to whether the same documents that were there in '85 were there in '91.
THE COURT: Sustained.
BY MR. BERNICK:
Q. Did you make inquiry in 1981, Dr. Appleton, concerning the location of these documents that had been sent down to storage?
A. Yes.
Q. Okay. And where did you find --
Having made that inquiry of the library, were you directed to a certain location where these documents were stored?
MR. CIRESI: Same objection, Your Honor.
THE COURT: Sustained.
Q. What knowledge, if any, do you have, Dr. Appleton, concerning the location of these documents in storage?
MR. CIRESI: Objection, no foundation.
THE COURT: Sustained.
Q. Dr. Appleton, could you tell us what you did in 1981 in connection with these documents?
MR. CIRESI: Objection. He wasn't there in 1981.
MR. BERNICK: I'm sorry, 1991.
THE COURT: Better.

A. Yes. When I --
MR. CIRESI: Well excuse me, Your Honor, I'm going to object with respect to "these documents." There's no foundation of this witness, who was not there in 19 -- 1985, as to what documents were there when he came back in '91.
MR. BERNICK: That's what I'm trying to lay the foundation for, Your Honor. That's why I asked the question.
THE COURT: All right. Well if he wasn't there, I don't think he can testify as to what documents were there.
MR. BERNICK: I think the witness has made inquiry and he's prepared to talk about exactly what he did to ascertain their location.
THE COURT: No. He's not qualified.
MR. BERNICK: Can I be heard at side-bar on this, Your Honor, briefly?

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(Side-bar discussion as follows:)

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(Side-bar discussion concluded.)

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BY MR. BERNICK:
Q. Dr. Appleton, in 1991 did you go down to see the storage area that housed R&D files?
A. Yes, I did.
Q. And when you went down there in 1991 to take a look at the storage files, did you in fact find R&D reports that had come from BATCo?
A. Yes.
Q. Okay. Did you make any examination of the R&D reports that had come from BATCo and were located in that storage area?
A. Yes, I did.
Q. Okay. And could you just tell the jury in your own words what you observed was in that collection of documents.
THE COURT: Counsel.

(Side-bar discussion as follows:)

(Side-bar discussion concluded.)

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BY MR. BERNICK:
Q. Let me direct your attention specifically to JANUS series reports. Did you find any JANUS series reports in the storage area at that time?
A. Yes, I did.
Q. What JANUS series reports did you find in the storage area at that time?
A. I believe they were all there. There was a large collection of about 15 reports.
MR. CIRESI: Move to strike the answer, Your Honor.
THE COURT: The answer will be stricken.
BY MR. BERNICK:
Q. Did you make any effort to see how many JANUS reports --
Forget about what you saw in the storage for just a moment. Okay? I'm just going to ask you if you know today how many JANUS series reports there were.
A. Fifteen.
Q. Okay. And when you went down to the storage area in 1991, did you find those series of reports there or did you not?
MR. CIRESI: Objection, Your Honor, misstatement.

THE COURT: No, you can answer that.
A. Yes, I did, and they were there.
Q. Now Dr. Appleton, I want you to take a look at Exhibit GM00007, which is at volume one, tab five.
A. I see it.
Q. And is this another memo from Mr. Wells?
A. Yes.
Q. And was it generated and maintained in the ordinary course of business by Brown & Williamson?
A. Yes.
MR. BERNICK: Offer it as a business record.
MR. CIRESI: Your Honor, there's no Bates number on this document. May we have the Bates number for this?
THE COURT: Do you have that, counsel?
MR. BERNICK: Do we know?
THE COURT: Anyone know?
MR. BERNICK: We'll have to --
Can we check during the break, Your Honor?
THE COURT: All right. I will receive GM000007.
MR. CIRESI: Your Honor, we don't know without the Bates number whether it was produced in discovery or not.

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THE COURT: Okay. Can you --
MR. CIRESI: There's no way for us to verify it.
THE COURT: Just a moment. Can you represent that it was produced in discovery?
MR. BERNICK: I don't have the Bates number, so I'm not in a position to make that representation, Your Honor. This was a trial exhibit. They've had it for a long time. But I cannot make the representation because I don't have the piece of paper with the number on it.
THE COURT: Okay. Can we --
MR. CIRESI: Well Your Honor, then we would object because there's no way for us to isolate the document in the computer database and find out what's there or not there without the Bates number.
MR. BERNICK: We don't think there's any prejudice to counsel. This document was afforded to them at least as a trial exhibit. It bears directly on the subject matter. It was designated for his testimony.
THE COURT: Well that isn't the point, counsel. If it wasn't produced in discovery, then you know that it's not available to use.
MR. BERNICK: Do you have any idea?

THE COURT: Anyone know?
MR. BERNICK: No one who's sitting here. We don't have access to the database to be able to find out, Your Honor.
THE COURT: Well I can't imagine anyone outside of here has any more expertise than those that are inside.
MR. BERNICK: Yeah. Well they have -- maybe they can tap into --
I'll tell you what, I'll pass it by for now --
THE COURT: Okay.
MR. BERNICK: -- and maybe after the break we'll come back.
THE COURT: All right.
BY MR. BERNICK:
Q. I want to turn from talking about the storage and preservation of documents to talking about discoverability of documents, producing documents in discovery.
Do you recall being asked about this exhibit, Exhibit 26202? It's another memo from Mr. Wells dated June 15, 1979.
A. Will you please give me the tab number?
Q. It is at tab -- volume one, tab 10.
A. Yes.

Q. And do you recall that this is one of the documents that referred to the possibility of, as it says, "Continued Law Department control is essential for the best argument for privilege?"

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A. Yes.
Q. And there's another document that is 26203, which is at volume one, tab 11, and this was another document that talked about a procedure for handling B.A.T scientific documents.
A. Yes.
Q. Okay. Do you know, Dr. Appleton --
These are both dated in 1979; correct?
A. Yes.
Q. We'll call them Wells memos.
Do you know from your own personal knowledge whether any of the procedures described in these memos actually was put into place?
MR. CIRESI: Objection, Your Honor, there's no foundation.
THE COURT: You'll have to lay foundation for that.
MR. BERNICK: Well Your Honor --
Q. I'll put it this way: Do you have any personal knowledge at all, Dr. Appleton, as to what, if anything, happened as a result of these

recommendations -- these ideas?
A. No, I don't.
Q. Are you --
Have you reviewed the history of what happened in connection with lawsuits that were pending during this period of time? Do you have any personal knowledge of that?
A. No.
Q. The discovery process, as Mr. Ciresi indicated in questioning you, takes place during the course of lawsuits. You are familiar with the discovery process; are you not?
A. Yes, somewhat.
Q. Do you know that when discovery takes place, requests are made, responses are given, and then often the lawyers get together to agree upon what will be submitted in discovery, --
MR. CIRESI: Objection.
Q. -- is that something --
MR. CIRESI: Objection, Your Honor.
MR. BERNICK: Excuse me.
MR. CIRESI: The witness is -- or the -- Freudian slip. Counsel --
THE COURT: That is legal counsel.
MR. CIRESI: Counsel is leading and

testifying at this point.
THE COURT: I don't know. I didn't hear the end of his question. He may or may not be. So I'll let him finish his question and then I'll rule.
Q. Do you have any familiarity with the process whereby, when discovery is served, there often is a dialogue between the lawyers about what the discovery will turn out to be?
MR. CIRESI: Objection, Your Honor,

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leading, no foundation.
MR. BERNICK: It's a foundational question. I'm asking if he knows.
THE COURT: Okay. Well he can answer that, if you know.
A. Yes, I have some knowledge of that.
Q. Do you know --
Do you have any personal knowledge of what if anything happened during the discovery process in any of the cases that post-dated Mr. Wells' memos?
A. No.
Q. Do you have any knowledge of any case that was pending between 1980 and 1993, any case in which Brown & Williamson was found to be in default of its discovery obligations?
MR. CIRESI: Objection, Your Honor, we're

getting into an area yesterday where counsel objected.
THE COURT: Well --
MR. BERNICK: I'm asking if he has any knowledge of that at all.
MR. CIRESI: Well he's suggesting that there is --
MR. BERNICK: I don't think there is, but --
MR. CIRESI: -- a particular set of events or not.
THE COURT: I don't really think he's going to be the person to testify as to what the attorneys did or did not do.
MR. BERNICK: I understand that, but there were questions from counsel yesterday about what happened as a result of the discovery process. All I'm trying to establish --
THE COURT: You objected and I sustained your objection.
MR. BERNICK: That's correct, and all I'm trying to establish is that this witness was not involved and cannot testify to any aspect of this discovery process.
THE COURT: Okay. Why don't you ask him

that question.
BY MR. BERNICK:
Q. Do you have any knowledge, can you testify to any aspect of the discovery process and whether it was affected by Mr. Wells' memos or not?
A. No, I don't.
Q. Let's talk a little bit about additives. Have you done work in connection with additives in cigarettes?
A. Yes, I have.
Q. Okay. Has that been an area in which you have focused much of your attention during the period of time that you've been involved with the tobacco industry?

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A. Yes. It's been a major area.
Q. Based upon your knowledge and your knowledge of the literature in this area, does the fact that cigarettes contain additives, has that fact been some secret?
A. No.
Q. Could you tell us whether the '64 Surgeon General's report has a whole section relating to additives?
A. I believe I testified yesterday that it does, it does mention that.

Q. What if any efforts -- publications -- has the tobacco industry made of additives even prior to the early 1980s?
A. Well they've published many things on it. There's an annual tobacco chemistry research conference. At that conference there is many abstracts and presentations given and many of those presentations and abstracts pertain to use of additives. In particular, there's one specific document that I have a recollection of that was published by RJR that talked about additives and listed hundreds and hundreds of additives, flavor ingredients largely, that can be used in the manufacture of cigarettes, and as I testified yesterday, in 1994 the industry released its entire list of ingredients to the public, and that document is now available on the Internet.
Q. Prior to the mid 19 -- early to mid-1980s, was there any regulatory requirement, to your knowledge, regarding the disclosure and testing of additives?
A. No, there were not.
Q. I want to direct your attention to the 1979 Surgeon General's report, which is Exhibit GJ000113, it's volume two, tab 69, and in particular page 14-63.

A. Okay.
Q. Do you see where it says, "More importantly, however, the trend toward low-tar, low-nicotine cigarettes and toward a reduction of undesirable volatile smoke compounds has brought about major changes in the smoke flavor of cigarettes. The use of rolled stems and reconstituted tobacco sheet admixed with leaf lamina and the use of effective filter tips are major factors inducing changes in smoke flavor. All of these developments have led to increased use of flavor additives, especially for low-tar, low-nicotine" -- the next page, I'll pick it up here -- "cigarettes. In fact, these new cigarettes require flavor corrections by additives in order to be acceptable to the consumer. Tobacco extracts as well as nontobacco flavors, such as licorice, cocoa, fruit, spices and floral compositions are used. More recently, suggestions for synthetic flavor additives for cigarette tobaccos

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are increasing in the patent literature."
Then it goes on to say, "At present, the selection of tobacco flavor additives from the GRAS," that is "(Generally Regarded As Safe) list, or from natural extracts and the screening of their smoke decomposition products for toxicity or other

biological activity are not required by the law and are done voluntarily by the manufacturers."
Was that an accurate statement of the state of regulatory -- or regulation of additives at that time?
A. Yes, it is.
Q. Now did the change --
Did the situation change in the ensuing years?
A. Yes, it did.
Q. What were the changes that came about by the mid-1980s?
A. Well around 1984 there was put into legislation a law requiring the disclosure of the ingredients that the industry uses on an annual basis. At that --
I believe the first disclosure was made in 1985.
Q. Now prior to the time that the regulation actually came into place in 1984, was there or was there not some anticipation within the industry that these regulations might come about?
A. Yes, of course.
Q. I want to direct your attention to Exhibit 26199, which is in evidence. This is another memo from Mr. Wells; is it not, relating to additives?
A. Yes, it is.

Q. Now this talks about some discussions, including the possibility that was raised here according to Mr. Wells' memo by Lorillard that the industry should immediately appoint an independent panel of reputable toxicologists. Do you see that?
A. Yes.
Q. Now later on in the memo in 1981 -- and this is now at page three -- there is discussion again about this idea of an industry panel of toxicologists. Do you see that?
A. Yes.
Q. And it's there that the jury's heard this statement, that basically is in the middle of the paragraph, "If company testing began to show adverse results pertaining to a particular additive, the company control would enable the company to terminate the research, remove the additive, and destroy the data." Do you see that?
A. Yes, I do.
Q. Was the industry panel of toxicologists that led to this discussion, was that industry panel of toxicologists formed at that time and for that purpose?
A. No.

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Q. Are you aware of any effort to do what is

reflected down here; that is, to develop the test results, terminate the research, and destroy the data, based upon your experience either at R. J. Reynolds or at Brown & Williamson?
MR. CIRESI: Objection, there's no foundation for this.
THE COURT: Sustained.
Q. When you were at Reynolds and Brown & Williamson, had you been involved directly in the additives area?
A. Yes, I had.
Q. And would you have the knowledge and experience regarding additives testing and the disposition of additives data?
A. Yes, I do.
Q. And based upon your knowledge and experience at those two companies, are you aware of any situation in which what is said in this memo actually occurred?
MR. CIRESI: Objection, no foundation.
THE COURT: Sustained.
Q. Dr. Appleton, back in 1981 and then at Brown & Williamson, have you been familiar with the testing programs that have been undertaken in connection with additives?
A. Yes.

Q. Okay. Are --
Is that an area of your personal involvement from a business point of view?
A. Yes.
Q. Okay. Could you tell us a little bit about Brown & Williamson's additives testing program.
MR. CIRESI: Objection with respect to time, Your Honor.
THE COURT: Use a time period, counsel.
Q. During the period of time that you've been at Brown & Williamson.
A. Well we make a thorough assessment of the -- both the regulatory status and the health effects of all ingredients we use. The principal elements involved looking at the structure of the material, any impurities or contaminants; we look at the regulatory status both in food laws and in those laws that pertain to use of tobacco ingredients; we of course look at the levels that are used, because that's the most important factor, really, in the likelihood that the material may influence the composition of smoke and its basic properties; we review the health-effects literature; we make an assessment of what its decomposition products may be; we look to verify if there is any indication that

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it's on any prohibited list; we look at the history of use, natural occurrence, the whole range of things. And if there's any information missing, then we'll do testing, whatever testing is required to fill those gaps.
Q. In the course of your work --
MR. CIRESI: Your Honor -- excuse me, counsel -- again we don't have the time. It started in 1991. We don't know what was done at what point in time.
THE COURT: Okay. Well I believe the testimony relates to the time that he was there --
MR. BERNICK: For the period of time --
THE COURT: -- from '91 to '94; right?
MR. BERNICK: That's fine. That was the purpose of the question.
THE COURT: Okay.
BY MR. BERNICK:
Q. Now during that period of time, did you take any steps to become familiar with the history of what Brown & Williamson had done in connection with additives testing?
A. I'm -- I --
I became aware of some of the steps that they had taken, yes.

Q. And based upon the knowledge that you developed along those lines from 1991 through the day on which this suit was filed in 1994, did you become aware of any situation where testing data relating to additives was destroyed?
MR. CIRESI: Objection, no foundation.
THE COURT: Sustained.
Q. Based upon your own personal experience from 1991 to 1994, are you aware of any situation where additives testing data was destroyed?
MR. CIRESI: Objection, no foundation.
THE COURT: Sustained.
Q. I want to direct your attention to Exhibit 26186, which is tab -- volume two, tab 71. Do you recall this is a memo relating -- from Mr. Wells relating to flavor transfer to cigarette smoke?
A. Yes.
Q. And this is the memo that refers, does it not, at the second page, to the following language, it says, "If R&D elects to perform the experiments at Southampton, R&D should ask Southampton to avoid any mention of health or biologic consequences in the report or in any other documentation pertaining" -- or "in other documentation pertaining to the experiments." Do you see that?

A. Yes, I do.
Q. Was this additives testing or this flavor transfer testing actually done at Southampton, based upon your review of the R&D reports?
MR. CIRESI: Objection, Your Honor, no

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foundation.
THE COURT: Okay. Can you rephrase that as to what flavor testing you're talking about, counsel?
MR. BERNICK: Yes.
BY MR. BERNICK:
Q. Are you familiar with the flavor-transfer-to-cigarette-smoke testing that was done at BATCo?
A. Yes.
Q. And has that been part of the material that you've reviewed and relied upon in connection with this case?
A. Yes.
Q. And could you tell me whether those experiments actually were done?
A. Yes, they were done and they were published.
Q. Now after the regulations came into place in the mid-1980s regarding additives, could you tell me what, if anything, was done to disclose additive information to the federal government.
MR. CIRESI: Is that up to 1994, Your

Honor?
MR. BERNICK: Up to 1994.
A. Okay. Well the regulations gave very specific types of information that we were supposed to provide, and we did that. We -- we worked through Covington & Burling, a law firm, who would --
We submitted our individual lists from each company. They compiled the list into a composite list -- list which was provided for -- it was a provision that was permitted within the regulations, and that's been submitted to the government.
Q. Now why was it that the decision was made to have a law firm involved in that submission process?
A. Well two reasons. One is to get -- this was a regulatory submission, but also to -- since we provided a composite industry list, we needed a third party to put that list together so it could be done in such a way that no -- none of -- none of the competitors knew what each of the other companies was in fact using. That was known only to Covington & Burling and the government.
Q. Okay. Now subsequent to the submission of those lists, what if any toxicological risk assessments were performed regarding additives used in cigarettes, again up to the date this lawsuit was

filed?
A. Well a whole range of things were done. As I just described, there -- there's been a lot of information published in the public literature, information published at tobacco chemists research conference meetings, internal work. We had done a whole range of things, going through the list I just mentioned.
Q. Okay. I want to direct your attention to questions that were asked of you on cross-examination

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concerning data on the risks associated with lower delivery cigarettes. Do you recall those questions?
A. Yes.
Q. And do you recall that counsel asked you whether there was any information that you or your company had regarding reduced risk associated with low delivery cigarettes? Do you recall that?
A. Yes.
Q. Okay. I want to direct your attention once more to the 1981 Surgeon General's report, which is TG000237, volume two, tab 51, page 18. Do you see where it says, "Today's filter-tipped, lower 'tar' and nicotine cigarettes produce lower rates of lung cancer than do their higher 'tar' and nicotine predecessors. Nonetheless, smokers of lower 'tar'

and nicotine cigarettes have much higher lung cancer incidence and mortality than do nonsmokers." Do you see that?
A. Yes, I do.
Q. Now did Brown & Williamson do its own research on the issue of risks associated with low delivery cigarettes?
MR. CIRESI: Objection as to time and foundation, Your Honor.
THE COURT: Okay.
Q. During the period of time that you were there and have been there, up through August of 1994.
A. Well we always monitor the literature, but we weren't conducting any of our own research.
Q. As of the time this lawsuit was filed, what if anything did Brown & Williamson rely upon as their source of data/information on whether low delivery cigarettes have a lower risk of disease?
A. The external published literature, as indicated in the individual papers and summarized here by the Surgeon General.
Q. I want to direct your attention to Exhibit 4994, which is at volume two, tab 39.
A. Yes.
Q. And particularly I want to direct your attention

to page 86. Does that section provide an update of the statement we just read out of the 1981 report?
A. Yes.
Q. Directing your attention to what then is the follow-up comment by the author --
Who's the author of this monograph?
A. I believe it was --
This particular chapter was Jonathan Samet.
Q. What does Dr. Samet say in 1996 concerning the state of science on reduced risk associated with low delivery cigarettes?
A. I believe he summarizes --
MR. CIRESI: Excuse me. Did you say '96, counsel?
MR. BERNICK: I did. Is it a different

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date?
MR. CIRESI: Conference was in '94. December 2nd to 4th, '94.
MR. BERNICK: Well the publication is what date?
MR. CIRESI: He said what he said at the conference in 1994.
MR. BERNICK: Fine. I'll rephrase the question.
BY MR. BERNICK:

Q. As of the time that Dr. Samet wrote this article, what was he saying about the state of science?
A. He was up -- as --
As we talked about, he was updating the state of science since the 1981 Surgeon General's report.
Q. Have you read Dr. Samet's expert report in this case?
A. No, I haven't. Well I've read passages of it.
Q. Have you read passages relating to the reduced risk of cancer associated with low delivery cigarettes for this case?
A. Yes.
Q. Okay. According to Dr. Samet's views today, is there or is there not a reduced risk of cancer associated with low delivery cigarettes?
MR. CIRESI: Objection, it's a mischaracterization. And I'd also like a foundation as to when he read this.
THE COURT: Okay. We should probably know when he read it and what he read.
MR. BERNICK: Okay.
BY MR. BERNICK:
Q. Dr. Appleton, have you read Dr. Samet's expert report in this case?

A. Yes.
Q. And when did you do that?
A. It's been a while, so I --
It's going to be hard to pinpoint it. Probably maybe eight months ago, six to eight months ago.
Q. Okay. Was that in connection with your work on this case?
A. Yes.
Q. Okay. And did you read the portions of that report that related specifically to the reduced delivery risk rates?
A. Yes.
Q. Okay. And was the conclusion that you read in that report any different from the conclusion expressed here?
A. No.
MR. CIRESI: Objection, Your Honor, calls for hearsay with regard to the report.
MR. BERNICK: Dr. Samet's an expert who's been called for the state, Your Honor.

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MR. CIRESI: Right, and he testified, Your Honor. The report is hearsay.
THE COURT: Okay. He can talk about the testimony of Dr. Samet.
MR. BERNICK: Your Honor, I would

respectfully submit that the report was offered by the expert on behalf of the state. It's a statement of a representative, and therefore it's not hearsay.
THE COURT: No. Once we have the testimony of the person, then we need to rely on the testimony of the person. That's why we have live testimony.
He can testify as to what the testimony of Dr. Samet was and what it showed.
MR. BERNICK: Okay.
THE COURT: Assuming he's read the testimony.
MR. BERNICK: Well actually we had him read the report itself.
THE COURT: Did you have him read the testimony?
MR. BERNICK: No, we did not have him read the testimony --
THE COURT: Okay.
MR. BERNICK: -- itself. We had him read the report.
THE COURT: Then the objection is sustained.
BY MR. BERNICK:
Q. Dr. Appleton, I want to talk to you -- with you for a moment about causation. You were asked

questions on cross-examination concerning causation. I want to direct your attention to Exhibit 11028, which is the 1958 trip report. Do you recall that?
A. Yes.
Q. Have you determined, from a review of the scientific literature at the time, whether or not there were scientists as of the date of this trip report who believed that it had not been established that smoking causes disease?
A. Well I -- I --
Yes, I've reviewed the literature, and at this time period a range of views were being expressed. Some people expressed strongly that they felt that causation had been established, some people doubted it and felt that all the evidence wasn't in.
MR. BERNICK: I want to offer a series of documents, Your Honor. If I could do it at the same time, I think it would expedite this process. So I'd just like to do them one after another and we can just display portions of them, if that's all right.
MR. CIRESI: Well Your Honor, we need a foundation as to whether this was just pointed out to this witness, when he read it. I have no idea what documents he's referring to.
THE COURT: I'm not sure I follow what

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you're going to do here, counsel.
MR. BERNICK: Let me just try and we'll see how it goes.
THE COURT: Okay.
BY MR. BERNICK:
Q. I want to direct your attention to volume one, tab 22, which is Exhibit BYT000217.
A. Yes.
Q. Is that an article that appeared in the Journal of the American Medical Association?
A. Yes.
Q. Is that a reliable authority within your field?
A. Yes.
Q. Have you relied upon this in connection with your work on this case?
A. Yes.
MR. BERNICK: We offer it as a learned treatise.
MR. CIRESI: No objection, Your Honor.
THE COURT: Court will receive BYT000217.
BY MR. BERNICK:
Q. Directing your attention to the next document, volume one, tab 23, which is BYT000220, is that another article that appeared in the Journal of the American Medical Association?

A. Yes.
Q. Is it a reliable authority within your field?
A. Yes.
Q. Have you relied upon it in connection with your work in this case?
A. Yes.
MR. BERNICK: We offer it as a learned treatise.
MR. CIRESI: No objection, Your Honor.
THE COURT: Court will receive BYT000220.
BY MR. BERNICK:
Q. Direct your attention to volume one, tab 25. Do you see that this is a journal article from Minnesota Medicine, the official journal of the -- and it's got a whole series of different medical associations.
MR. CIRESI: May we have an exhibit number?
MR. BERNICK: Yeah, I'm sorry. This is Exhibit BYG000032.
MR. CIRESI: BYG?
MR. BERNICK: Yes.
Q. Is this the official journal of a variety of medical associations here within Minnesota?
A. Yes.
Q. And is it owned and published by the Minnesota State Medical Association?

A. Yes.

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Q. And have you relied upon it in connection with your work in this case?
A. Yes.
MR. BERNICK: We'll offer that as a learned treatise as well.
MR. CIRESI: No objection, Your Honor. I believe this is a review; is it not, doctor?
THE WITNESS: Yes.
MR. CIRESI: Okay.
THE COURT: Court will receive BYG000032.
BY MR. BERNICK:
Q. Beginning with the last one, is this an article that appeared in 1962?
A. Yes.
Q. And as it appeared in 1962, is the -- let's get the cover page on here -- in Minnesota Medicine?
A. Yes.
Q. And is it authored by Lewis Robbins, who is or was at the time the chief of the Cancer Control Program for the Bureau of State Services at the Public Health Service?
A. Yes.
Q. And does Dr. Robbins, even in 1962, talk about the difference between the views of a medical

practitioner, i.e., a doctor, with regard to causation, and the perspective of a scientific investigator on the issue of causation?
A. Yes, he does.
Q. And what if anything does Dr. Robbins report in 1962 about whether causation has been established depending upon whether you are a doctor, acting as a doctor, or whether you're acting as a scientific investigator?
A. What he -- what he points out is that it's -- it's --
People had expressed various views and he was reconciling how could that be, and what he did was -- is -- is indicate when one is looking at it from a specific scientific point of view, they might identify what isn't known and the information gaps and have doubts about what's really happening and not take the view, necessarily, that all the data is in. On the other hand, he contrasts that with a medical practitioner who is not in the position to weigh the facts, weigh the evidence, and wait until more evidence comes in, but rather has to act and make public health-type recommendations with the evidence at hand, primarily the epidemiology, and based on that would come to the conclusion, from the practical

point of view, causation may have been proven. So what he's doing is drawing a distinction between, in my view, the experimental evidence and the epidemiological evidence.
Q. Directing your attention to page 135, do you see where as part of his conclusions he talks about the

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perspective of the medical investigator?
A. Yes.
Q. It says, "For the medical investigator, however, the evidence still does not add up to conclusive proof that cigarette smoke causes lung cancer. And his major problem is to define the conditions under which such proof might be forthcoming. The practitioner, on the other hand, has a different problem and a different responsibility. His concern is for the individual patient -- not as an entity in a controlled study, but as a human being whose life he wants to protect. The long 'incubation period' of lung cancer in man may be an insurmountable obstacle to the medical investigator; but for many practitioners, it appears to be a possible opportunity to prevent the occurrence of a prognostically poor disease, whose damage is irreversible. The investigator can afford to suspend -- to suspend judgment until he has

conclusive proof; the practitioner must practice."
Is the distinction that Dr. Robbins made back in 1962 a distinction that is consistent or inconsistent with the views that you've expressed to this jury?
A. I believe they're consistent.
Q. And according to Dr. Robbins' perspective as a medical investigator, even as of 1962, four years after the 1958 report, is there -- are there or are there not gaps or items of information that still have not been filled regarding causation?
MR. CIRESI: Objection, leading, calls for a characterization.
THE COURT: Well it is leading. I'll allow it though.
A. Yes, of course there still are scientific gaps.
Q. Directing your attention to the Silvette & Larson -- the Larson & Silvette text of 1968, which is volume two, tab 41, it is GC000007.
A. I've got it.
Q. Do you see that this is the supplement --
Do we have the hard copy here?
This is the 1968 supplement to the compendium of "TOBACCO, Experimental and Clinical Studies?"
MR. CIRESI: Is that the same one he has up there, the big stack?

MR. BERNICK: No. He's got the '68 portion.
MR. CIRESI: Oh, I'm sorry.
A. This one in my tab appears to be the '61, which would have been the original.
Q. Okay. Well let me just give you the '68 one. This is supplement number --
THE COURT: I have the '61, too.
MR. BERNICK: Oh, I'm sorry, Your Honor.
May I approach the witness, Your Honor? Thank you.

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(Document handed to the witness.)
BY MR. BERNICK:
Q. I'm going to show you this supplement in 19 -- supplement number one. Is that the supplement that was published in 1968?
A. Yes.
MR. CIRESI: Excuse me. Can we get the right one on the screen, Your Honor?
MR. BERNICK: Yes, it's G --
The one on the screen is the right one, I believe, counsel.
Q. It's Exhibit GC000007, already in evidence.
And do I have the right one up on the screen there?

A. Yes.
Q. And if you direct your attention to page 623 --
MR. BERNICK: Your Honor, I'm sorry I don't have an extra copy of this.
THE COURT: That's all right. Go ahead.
MR. BERNICK: Thank you.
Q. Page 623.
A. Yes.
Q. Do you see that the authors summarize many of the references in the scientific literature dealing with causation?
I'll get another portion of this that's a little bit clearer. See where it says, "As the generalizations above make abundantly clear, a very large number of writers has accepted the hypothesis, to some degree or other, that smoking, and particularly cigarette smoking" -- and there's a mark with an asterisk after the author's name -- "is causally related to lung cancer." And then we have a whole bunch of references that go down to the bottom of the page; is that right?
A. Yes.
Q. As you understand this summary in 1968, would this be a summary of publications where the scientist believes that causation has been shown?

A. Yes.
Q. If we then turn the page, does he have another paragraph which talks about "A considerable number of writers maintain, with good reason, that a causal relationship between smoking and lung cancer has not been proven or demonstrated; that the reported data do not warrant the conclusions drawn from them; and/or that the question of etiology cannot be decided on the basis of available information?" Is that another --
A. Yes.
Q. -- series of references?
A. Yes, I see that.
Q. And then he gives you all of those references?
A. Yes.
Q. And if we look at the dates, they include dates

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even after the Surgeon General's report in '64?
A. Yes.
Q. Okay. Now you have said that even as of today -- I think that your testimony was that there are matters concerning causation that are not known?
A. Certainly -- certainly all the questions are not answered.
Q. You talked about what is known and not known.
What if any research is continuing, even today,

to fill if those gaps?
MR. CIRESI: Well objection, Your Honor, it's beyond discovery.
THE COURT: Sustained.
BY MR. BERNICK:
Q. Well let's pick up 1994, Dr. Appleton. Well let me -- let me rephrase the question.
Talking about externally published scientific literature as of today. Is there research that continues today into the areas where there are still gaps?
MR. CIRESI: Same objection, Your Honor. If he wants to refer to the published literature that's out there, it's not continuing, it's been completed.
THE COURT: Okay. You can answer that question.
A. Yes, of course there's research continuing in this area.
Q. Okay. What kinds of research, again published research, are continuing in this area?
A. A wide range of things. The -- the -- the epidemiology is not as active any more, or even the basic toxicology, and the focus is going largely towards the in vitro and the biochemistry.

MR. CIRESI: Again, Your Honor, I'm going to object. It's outside the scope of his expertise, number one. He's talking about some type of medical examination that may be going on today.
THE COURT: Okay. Sustained.
MR. BERNICK: Well I'll rephrase the question.
BY MR. BERNICK:
Q. Were you asked on cross-examination about DNA adduct work?
A. Yes, I was.
Q. Could you tell us what DNA adduct work is and why it's being pursued.
MR. CIRESI: Again, Your Honor, with respect to the last part of that question, we're going to object because it goes beyond discovery.
THE COURT: Okay. You can ask what it is.
MR. BERNICK: Okay.
Q. Could you ask what -- "could you ask." Not going along very well this morning.
What is DNA adduct work? What is it designed to

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do?
A. Let me first describe what a DNA adduct is. DNA, for those who may or may not know, is the basic cellular component of the body of each cell that

directs every aspect of the cell and controls its metabolism and cellular functions and the products that it synthesizes, et cetera. An adduct is where a chemical, either generated inside the body or outside the body, chemically reacts with the DNA. And if this is DNA, a chemical reacts to it and literally sticks to it; it forms a chemical bond. And it's felt that that may be -- that -- that may have some bearing on the ability of a chemical to induce cancer. So when we talk about DNA adducts, we talk about areas of the DNA where these chemicals have stuck to the DNA. And that research has been an active area of chemical carcinogenesis, or the ability of chemicals to induce cancer, and that area has also -- it's focused on many areas, but there's also been a large focus on constituents that have been found in tobacco smoke to determine if they can form DNA adducts in various test systems.
Q. Again talking about causation, you were asked about this document, which is Exhibit 11913, 11913, which is at volume two, tab 73, and this was a TRC, a Tobacco Research Council document in June of '67, and it says, "The only real difficulties that we encountered arose out" presumably "of the unavoidable paradox at the center of our operations - namely that

on the one hand manufacturers -- the manufacturers control TRC's operations and in smoking has been proved to cause lung cancer while, on the other, TRC's research program is based upon the working hypothesis that has been sufficiently proved for scientific -- for research purposes."
Dr. Appleton, in the work that you are familiar with regarding product modification research, is there any conflict between conducting product modification research and taking the position that you've articulated to this jury that causation has not been proven? Is there any inconsistency?
MR. CIRESI: Objection, Your Honor, there's no foundation for him conducting that research.
THE COURT: Sustained.
Q. Based upon your review of the toxicological research done in connection with product modification, is there any inconsistency between the tox work that you've reviewed on the one hand and the position that you've taken on the other regarding causation?
A. Not in my view.
Q. Why is that?
A. Well as I indicated before, I -- I make the assumption based on the epidemiology that causation

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is in fact demonstrated, but we don't know the experimental evidence, and that's the only way we can do product modification research. Epidemiology doesn't give us a clue as to what needs to be done and what direction to go, and we can only do this through experimental research. But we don't know what --

The experimental research has not given us a clue as to whether or not smoking causes disease or how it may cause disease, and that's where the information gaps lie, is in the experimental side. Despite that, we continue to press on, using the techniques that are available to us that have been given to us by the scientific community in hopes that they may some day be regarded as definitive evidence, or that -- that the ultimate mechanism may be discovered and we can attack that mechanism and go after that, or the constituent or constituents in smoke that may be responsible are discovered and we can go after that, or some additional toxicological tests or set of tests may be ultimately developed which may be absolutely relevant to human disease, and then we can test our products in those methods and -- and gain, with some confidence, a degree of confidence that our product in fact, if it's negative

in those tests, is in fact safe or safer. And that's where we're working by trial and error, but we're hoping that the science will some day give us more definitive information on the experimental research side.

Q. If we talk about the position that you've expressed about causation, and that you've articulated in this courtroom --

A. Yes.

Q. -- the basis for that position, the factual scientific basis for the position as you've expressed it, is it -- is it -- can it be found only in the tobacco company research, or can it be found in the published research as well?

A. It's found in the published research.

Q. Those basic facts that are the basis of the causation position, have they or have they not been expressed in Surgeon General reports?

MR. CIRESI: Objection, Your Honor, this is now becoming repetitious.

THE COURT: It is getting a little repetitious if you're going to go into this in any great degree.

MR. BERNICK: I'm just laying foundation for what I hope will be --

THE COURT: Okay.

A. Yes. Yes.

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Q. Can we find a factual basis for your position in the Surgeon General's reports?
A. Yes.
Q. Okay. Now the position that causation has not been proven, is that something that has been out there publicly for others within the scientific community to challenge, to agree or disagree with?
A. Yes. Of course that's been -- that's out there publicly.
Q. For how long has the industry's view of causation been publicly open to being challenged by any scientist or any doctor who has knowledge of the facts?
MR. CIRESI: Well objection, Your Honor, it's irrelevant.
THE COURT: No, he can answer that.
A. For decades.
Q. The 1964 Surgeon General's report, if we go back 30 years, does the 1964 Surgeon General's report address the issue of causation, including the question of whether causation had been demonstrated or not?
A. Yes.

Q. What was the position expressed in the '64 report?
A. The position was that they felt that causation had been demonstrated, that cigarette smoking causes various diseases.
Q. Was that inconsistent or consistent with the view expressed by the industry?
A. Well in some ways it's inconsistent, in some ways it's -- it's not. It -- it is seen as being at variance, yes.
Q. What about the warnings, are the warnings consistent or inconsistent with the scientific view of causation that you've expressed?
MR. CIRESI: Objection, Your Honor, calls for speculation on the part of this witness. There's no foundation.
THE COURT: Sustained.
Q. For how long, Dr. Appleton, has the position that has been taken about causation been subjected to public scrutiny and criticism openly?
A. Decades, as I said before.
Q. Do you know how long the state of Minnesota has known about the risks of smoking and disease?
MR. CIRESI: Objection, Your Honor, it's way outside the scope of this gentlemen's knowledge,

expertise, or whatever he has to offer.
THE COURT: This is a brand-new subject, counsel. Let's not get into this one.
MR. BERNICK: I'll push on to something else.
THE COURT: Good idea.
BY MR. BERNICK:

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Q. Let's talk about addiction. Same questions with regard to addiction. Was addiction a matter that was addressed by the Surgeon General back in 1964?
A. Yes, it was.
Q. The position taken by the industry regarding addiction, is that a position that is based solely on tobacco company research, or can we also find it in the published literature?
MR. CIRESI: Objection, Your Honor, he can't speak for the industry. He's not here to testify for the industry.
MR. BERNICK: His own views.
A. Well it's in the open published literature.
Q. Has the position taken about addiction likewise been subjected to public scrutiny for over 30 years?
A. Yes, it has.
Q. Now you were asked some questions about free choice. Do you recall that?

A. Yes.
Q. I want to turn to the 1988 Surgeon General's report for just a moment. This is Exhibit 3820. It's at volume two, tab 75. And we can see by the title it says "NICOTINE ADDICTION."
I take it that you understand from this Surgeon General's report that in 1988 the Surgeon General found that smoking was addictive rather than being a habit as they had in '64?
A. Yes.
Q. Okay. Now at the time that the Surgeon General made that finding saying the right term is "addiction" as opposed to "habit" in 1964, did the Surgeon General also comment on the real-world experience of people who quit smoking?
A. Yes, he did.
Q. I want to direct your attention to page 466, and in particular let's take you down to the language which appears here. It says, "According to the 1985 National Health Interview Survey (NHIS), there are approximately 41 million former smokers in the United States. Approximately 90 percent of former smokers report that they quit smoking without formal treatment programs or smoking cessation devices." Do you see that?

A. Yes.
Q. Given the statement here, you were asked questions on cross-examination about warnings concerning addiction.
A. Yes.
Q. Do you know one way or another whether issuing a warning that said smoking is addictive would have made it easier or more difficult to get people to try to quit on their own?
MR. CIRESI: Speculation, no foundation.
THE COURT: Sustained.
BY MR. BERNICK:

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Q. Based upon the matter that is placed before you and based upon the questions posed in cross-examination, do you have a view one way or another on that? Do you know?

MR. CIRESI: Your Honor, same question. It still calls for speculation.

THE COURT: Well he can answer if he has a view, "yes" or "no."

A. No, I don't know if it would have made a difference or not.

THE COURT: That was not the instruction of the court, sir. Would you just answer as instructed by the court, please.

THE WITNESS: I'm sorry, I don't understand what I'm supposed to do.

MR. BERNICK: You were supposed to answer "yes" or "no."

THE WITNESS: Oh, I'm sorry.

THE COURT: The direction was you can answer "yes" or "no," which is a fairly simple instruction.

THE WITNESS: Okay. I'll need to hear the question again then.

THE COURT: Okay.

BY MR. BERNICK:

Q. Do you have a view, "yes" or "no," on whether the issuance of a warning saying smoking is addictive would have encouraged or discouraged those people who in the past had been capable of quitting on their own? Do you have a view, --

A. Yes, I do.

Q. -- "yes" or "no"?

A. Yes, I have a view.

Q. I want you to assume for purposes of my question --

Mr. Ciresi asked you to assume that people's choice was limited comparatively if they were addicted. I want you to assume a different thing. I

want you to assume that regardless of whether you call it addiction or regardless of whether you call it habit, that people have the ability to choose to quit. Can you make that assumption with me?

A. All right.

Q. They have the ability to make their own choices. I want you to assume that.

Do you believe it should be possible for people who want to continue to smoke to do so?

MR. CIRESI: Excuse me, Your Honor, there's no foundation in the record for that assumption.

THE COURT: You can answer.

A. Yes, I believe people should be able to smoke if they wish to.

Q. And people who wish to continue to smoke, do you feel that that's a matter where they are responsible for their decision?

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A. Yes, I believe they are.
MR. CIRESI: Your Honor, I'm going to move to strike that. That's an inappropriate question for this witness.
MR. BERNICK: Your Honor, this is exactly the subject matter that was pursued on cross-examination.
MR. CIRESI: No, it was not, Your Honor.

THE COURT: Well it's close enough. I'll let the answer stand.
BY MR. BERNICK:
Q. And is that right to choose to continue to smoke a right that is still recognized in every state of the union?
MR. CIRESI: Objection, irrelevant.
THE COURT: Sustained.
MR. BERNICK: I have no further questions, Your Honor.
THE WITNESS: Your Honor, could we take a break?
THE COURT: We'll take a five-minute recess.
THE WITNESS: Five minutes? Okay. That's all it's going to take.
THE CLERK: Court stands in recess.
(Recess taken.)
THE CLERK: All rise. Court is again in session.
(Jury enters the courtroom.)
THE CLERK: Please be seated.
THE COURT: Counsel.
MR. CIRESI: Thank you, Your Honor.
Good morning -- I guess it's good afternoon, ladies and gentlemen.

(Collective "Good afternoon.")

RE-CROSS EXAMINATION

BY MR. CIRESI:
Q. Good afternoon, doctor.
A. Good afternoon.
Q. Now Mr. Bernick directed your attention to the 1988 Surgeon General's report regarding addiction, and he directed you to page 466; correct?
A. Yes.
Q. And sir, have you reviewed the literature with respect to the number of those individuals who relapsed and started smoking again?
A. Yes, I reviewed some of the literature.
Q. And do you know that a substantial portion of people relapsed after they quit temporarily?
A. Yes, I believe so.
MR. BERNICK: Objection, Your Honor. Objection, Your Honor. I don't know that that refers to the particular statement that I pointed out in the report. These are --
THE COURT: It is directly relevant to the

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statement you pointed out.
BY MR. CIRESI:
Q. And you'll recall yesterday that I asked you

about the 1994 FTC monograph seven.
A. Yes.
Q. And I asked if you had read page 113; correct?
A. Yes, you did.
Q. And we didn't have the exhibit in court at that time. Do you recall that?
A. Yes.
Q. Now I'd like to direct your attention, sir, to that Exhibit 4994. And we'll put it on the overhead.
MR. CIRESI: And Your Honor, may I approach the witness?
I'll give you an extra copy, doctor.
THE WITNESS: Okay.
MR. CIRESI: Just so it's easier for you to follow.
THE WITNESS: Okay. And this is page 113?
MR. CIRESI: 113, please.
BY MR. CIRESI:
Q. Do you see at the body -- bottom, "Smoking -- Cigarette Smoking as Drug Dependence: Addiction Severity?"
A. Yes.
Q. By Jack E. Henningfield and Leslie Schuh?
A. Yes.
Q. "Several findings bear on the issue of the

strength of dependence on cigarettes. Although 70 to 90 percent of smokers are interested in quitting, only one in three succeeds before age 65." Do you see that?
A. Yes, I do.
Q. And do you recall yesterday I was asking you about that, the vast majority who could not quit before the age of 65? Do you remember me asking you that?
A. Yes.
Q. And you had read this before; had you not, sir?
A. I think I read this passage, yes.
Q. And it goes on to state, "There is good and bad news about coronary bypass surgery and even a lung removal. The good news is that these traumatic events are among the most powerful incentives to quit smoking. If one intervenes with patients who undergo these procedures, about one-half of them quit." Do you see that?
A. Yes, I do.
Q. And intervention is the type of intervention, sir, that is practiced at the Mayo Clinic in Dr. Hurt's nicotine dependence clinic; isn't it?
A. I don't know what intervention they're referring to here.

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Q. This refers to intervention by medical doctors in an attempt to help people quit smoking; doesn't it?
A. I assume so. I --
Without reading the rest of this, I don't recall that. There could be all kinds of intervention. We talked about Mr. Fit's study which was an intervention trial. That's a different type of intervention. If this is a smoking-cessation clinic, then I assume that that's what that kind of intervention means.
Q. "If one intervenes with patients who undergo these procedures, about one-half of them quit. However, the bad news is that the other half or more soon return to smoking (U.S. Department of Health and Human Services, 1988)."
That means one-half of the people who have bypass surgery or a lung removal cannot overcome their addiction, and they return to smoking; doesn't it, sir?
A. That's what that document says, yes.
Q. And it goes on to state, "There are two lessons here. First, incentives and motivation are human -- important factors in the treatment of nicotine and other drug dependencies. Second, incentives and

motivations have limitations; even the threat of death is not sufficient for half these smokers to stop smoking.
"This is a tenacious addiction in which, despite so many people wanting and trying to quit, fewer than 1 in 10 has a 1-year success, and this means that only 2 to 3 percent of smokers stop smoking each year. Indeed, as Kozlowski and colleagues (1989) show, more than half of heroin and cocaine users and alcoholics rate smoking cigarettes as harder to give up than these other drugs." Do you see that?
A. Yes, I do.
Q. "Thus, there are strong biological pressures in nicotine-dependent humans that do not exist in machines to sustain addictive levels of nicotine intake." Do you see that, sir?
A. Yes, I do.
Q. And you have read many studies which show that in the medical literature; haven't you?
A. I have read studies that show a range of responses and a range of results concerning smoking cessation.
Q. And Mr. Bernick pointed out to you the Robbins article. Do you remember that?
A. Yes.

Q. What did that say?
A. Well --
Q. The one he -- the one he --

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The portion he pointed out to you, what did it say?
A. Well the Robbins article, what it did was draw a distinction between the experimental evidence as opposed to the epidemiological or observational evidence and essentially said that, depending upon which position you're in and the reason why you're making an assessment, one may draw a conclusion and make an assumption about causation because of the nature of what they're doing, in this case the practitioner, as opposed to, if they're looking from a more pure scientific point of view, they might say all the facts don't seem to be here.
Q. What did it say where he pointed you specifically to the language, do you recall?
A. No, I don't. I'd have to see it again to refresh my memory.
Q. Okay. You didn't tell him to go there. He told you to go there. Isn't that right?
A. Well I'm not sure what you mean.
Q. What I mean, sir, is that Mr. Bernick, the lawyer, said that's where I'm going to direct you.

You didn't tell him to go there in that literature; did you?
A. Well we discussed the paper together, but when he presented it, he presented it. He was the one that was putting it up on the screen.
Q. Sir, he's the one that told you he was going to direct you to that segment; didn't he?
A. Just now, yes.
Q. And right above that segment, there's another statement; isn't there? Starting under the conclusions.
"CONCLUSION:
"Medical practitioners and medical investigators alike, have had the opportunity in the past few years to weigh the evidence that (a) condensates from cigarette smoke contain chemicals which are carcinogenic to animals" --
Do you see that?
A. Yes.
Q. Mouse skin-painting; correct?
A. Yes.
Q. -- "(b) cigarette smoke injuries the bronchial epithelium" --
Inhalation studies; correct?
A. Most likely.

Q. -- "(c) smokers are at a higher risk of lung cancer than are non-smokers." Do you see that?
A. Yes, I do.
Q. And then it says, "None, or very few, deny the validity of this evidence." Isn't that right?
A. That's what it says, yes.
Q. And they're talking about the validity of inhalation studies and of mouse skin-painting; aren't

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they, sir?
A. Well it seems to me they're talking about the existence of all three types of evidence under (a), (b) and (c) in that paragraph.
Q. And they say, "None, or very few, deny the validity of this evidence." That's what Dr. Robbins said; correct?
A. That's correct.
Q. And we do know who denied it, don't we?
A. I'm not sure what you're asking.
Q. The cigarette industry denied it; didn't they, sir?
A. Well I can't speak for the industry, as you indicated. I -- I have no reason to take issue with any of those three points.
Q. So you believe that -- and believed that in 1967 -- that those were valid evidence; correct?

A. I believe that in 1967 condensates had been shown to produce skin cancer in animals, that cigarette smoke in inhalation tests had been shown to cause tissue changes, and that epidemiological studies had demonstrated a higher risk of lung cancer in non-smokers.
Q. And in fact --
A. Or I'm sorry, smokers have a higher risk of lung cancer than non-smokers.
Q. And in 1967 you would not have denied the validity of those studies; would you?
A. The studies are out there. They're there for what they are.
Q. That's not what I asked you.
In 1967 you would not have denied the validity of those studies; would you?
A. I don't believe so.
Q. You do know that the company that you now work for did deny the validity of those studies in 1967; don't you, sir?
A. I'm not -- I don't --
I'm not aware of a specific statement that you might be referring to. I -- I just don't know what they said back in 1967.
Q. Do you know if anyone in the industry denied the

validity of those studies in 1967?
A. No, I -- I don't have any specific -- anything specific to refer me to.
Q. And you talked about causation. Do you recall that, sir?
A. Yes.
Q. And then you referred to the Surgeon General's report; correct?
A. Yes.
Q. The Surgeon General has said that there is causation; correct?
A. Yes.
Q. And when did the Surgeon General determine there

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was causation of lung cancer in men?
A. 1964 was the first report.
Q. When did the Surgeon General determine there was causation with regard to lung cancer in women?
A. I don't remember exactly. I think that the Surgeon General had said there was suggested evidence even in '64, but I don't remember when the Surgeon General --
There was a specific Surgeon General's report that dealt with health effects in women, but I forgot the date of it.
Q. You have no idea what that date was; do you,

sir, as you sit here?
A. No, I don't remember it as I sit here, no. I do remember --
Q. You really can't say when the Surgeon General determined there was causation with respect to any other disease other than lung cancer in men; can you?
A. Well in 1964 the Surgeon General talked about several diseases, more than just lung cancer, but I don't recall exactly which disease was -- was dealt with in which report regarding men versus women. I know the reports are there, I've reviewed them; I just haven't committed that to memory, those dates.
Q. That's what I'm asking you. You cannot testify here when what disease was found to be caused by cigarette smoking by the Surgeon General of the United States; can you?
A. I have not committed those dates to memory, no.
Q. And you do know that the Surgeon General has said that there is no safe cigarette; correct?
A. Yes, I know the Surgeon General has said that.
Q. And you said that the Surgeon General was more authoritative than Casarett & Doull; is that correct?
A. I believe what I said was if somebody wanted to get information about the health effects of cigarette smoking, that would be the -- the source to go to,

the primary source to go to, and that Casarett & Doull is not viewed as the main source of health effects of cigarette smoking.
Q. And you said that it was more authoritative; didn't you?
A. I may have.
Q. And yet your company does not accept the authoritative statements of the Surgeon General that smoking causes lung cancer; does it?
A. We recognize the Surgeon General's statements are statements geared for a public-health purpose, not necessarily a specific scientific purpose. We don't take tissue at all with the Surgeon General issuing these warnings to the public, we think it's the appropriate thing to do, and based on the epidemiological evidence that is -- that is the appropriate thing to do. But we don't take issue with that.

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MR. CIRESI: Move to strike, non-responsive.
THE COURT: Sustained.
Q. Your company does not accept the authoritative statements of the Surgeon General that smoking causes lung cancer; does it?
A. From a public-health perspective and based on

the epidemiological evidence, I would say that those statements are appropriate.
MR. CIRESI: Move to strike.
THE COURT: Sustained.
Q. Your company does not accept the authoritative statement of the Surgeon General that smoking causes lung cancer; does it?
A. Again, as I said, we -- we don't take issue with that statement.
Q. That's not what I asked you.
It doesn't accept it; does it, sir? Can you answer that "yes" or "no"?
A. We -- we accept the statement from the point of view that we recognize it's a public-health warning to the public and an emphatic and unequivical message. It's not a weighing of the scientific evidence, considering both the weight of the epidemiology and the science. We accept it for what it is.
MR. CIRESI: Move to strike, Your Honor.
THE COURT: Sustained.
Q. Doctor, just a simple question, and I believe --
I don't mean to engage in dialogue with you, but I'd like to get through with this as quickly as you would. All right?

MR. BERNICK: Your Honor, we object to the commentary of counsel.
THE COURT: Well, doctor, please listen to the question and just answer the question as asked.
Q. Again, doctor, if you don't understand a question that I ask you, please tell me. Is that agreeable?
A. Yes.
Q. All right. Your company does not and has not accepted the authoritative statement of the Surgeon General that cigarette smoking causes lung cancer; has it?
A. I believe we have accepted that statement from the point of view of the public-health statement, and we view it as being appropriate to make.
Q. Point me to one public statement of Brown & Williamson where it said we accept what the Surgeon General has said, that smoking causes lung cancer. Tell me where they said that.
A. I know of public-health statements we've made, not necessarily those exact words, but the basic concept has been conveyed. I don't know if it's the exact words that you're offering, but we have offered

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the concept that we accept what the Surgeon General is saying and doing.

Q. Sir, can you point the ladies and gentlemen of the jury to one written statement of your company that says we accept what the Surgeon General says, smoking causes lung cancer?
A. As I said, I can think of public statements we've made that convey the basic message but don't have your exact words that you're offering. I can't think of anything we've done --
Those are your words.
Q. Point to one public statement that conveys the message that Brown & Williamson accepts the Surgeon General's statement that smoking causes lung cancer or any other disease. Point to one.
A. Well I've given numerous depositions and testimony in court. I believe those are public statements.
Q. Are you here prepared on behalf of Brown & Williamson to say right now under oath smoking causes lung cancer?
A. I've said what my testimony is.
Q. That's not what I asked you.
A. Based on the epidemiology -- sorry.
MR. BERNICK: Your Honor, can the witness just be permitted to answer the question?
THE COURT: Well the witness should answer

the question that's asked. Just listen to the question and answer the question that's asked, please.
Q. Are you prepared right now on the witness stand under oath to state on behalf of Brown & Williamson, yes, Mr. Ciresi, smoking causes lung cancer? Are you prepared to say that?
A. I can't give a "yes" or "no" answer. I would have to -- I would have to set out the -- what -- what I mean when I say -- when I answer your question. I don't think --
This is a very complicated issue. I don't think it lends itself to a simple "yes" or "no" answer when dealing with it in a scientific matter, which is what I'm here to deal with. And I'm a scientist and I look at it from a scientific point of view. I don't think it lends itself to a simple "yes" or "no" answer, and I don't think it's fair to try to force that.
If I can set out the -- the conditions of -- as to what I mean and what I mean when I give my answer, I can do that.
Q. Is your answer no?
A. I --
My answer is what it just was.

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Q. Is the World Health Organization made up of scientists?
A. Yes.
Q. Did they say smoking causes lung cancer?
A. Yes, they did, in making -- a public-health context, yes.
Q. Is the --
Is the American Medical Association made up of scientists?
A. Yes, of course.
Q. Have they said that smoking causes lung cancer?
A. Yes, they have.
Q. Is the American Cancer Society made up of scientists?
A. Yes.
Q. Have they said that smoking causes cancer?
A. Yes.
Q. Is the American Lung Association made up of scientists?
A. Yes.
Q. Have they said that smoking causes lung cancer?
A. Yes.
Q. Has every medical organization in the world said that smoking causes cancer?
A. Yes.

Q. Now sir, directing your attention to lawyers and research, Mr. Bernick directed your attention to Exhibit 26194 and 11946. Do you remember those?
A. Not by number, no.
Q. Do you remember that one involved mouse skin painting?
A. Who was the author and the date? The one that we just talked about, the Harrogate study?
Q. Talk about influencing -- the lawyers influencing the writing. Do you remember that?
A. If it's --
Well I think it's the one I just talked about. Yes, I remember that.
Q. Okay. If you turn your attention from --
THE COURT: Counsel, will you be going for a while?
MR. CIRESI: Yes, it will be about 20 minutes, 25 minutes.
THE COURT: Okay. Well we were planning on recessing at a quarter to 1:00.
MR. CIRESI: That's fine, Your Honor.
THE COURT: We'll recess and reconvene at quarter to 3:00.
THE CLERK: Court stands in recess, to reconvene at a quarter to 3:00.

(Recess taken.)

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AFTERNOON SESSION.

THE CLERK: All rise. Court is again in session.

(Jury enters the courtroom.)

THE CLERK: Please be seated.

THE COURT: Counsel.

MR. CIRESI: Thank you, Your Honor. Good afternoon, ladies and gentlemen.

(Collective "Good afternoon.)

BY MR. CIRESI:

Q. Good afternoon, doctor.

A. Good afternoon.

Q. This morning Mr. Bernick asked you about lawyers and research, and lawyers and publications. Do you recall that?

A. Yes.

Q. And you discussed Exhibit 26194, which was the Addison Yeaman memo to Mr. Finch in October of 1965. Do you recall that?

A. Yes.

Q. And you talked about Exhibit 11946, which was a tobacco research document of BATCo in April of 1985. Do you remember that?

A. I --

Q. Had to do with animal -- ceasing in-house animal

research.

A. I -- I think I know which one you're talking about. I'm not absolutely sure.

Q. And do you recall you testified that work after that point in time was done outside by third-party contractors?

A. Yes. Now I know which one you're talking about.

Q. And you also talked about a memorandum from Mr. Pritchard to Mr. Hardwick in January of 1985, I

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believe it was January 10th. Do you recall that?
A. What was the subject again? What was the content?
Q. That was the one to Mr. Hardwick about sending information to the law firm in --
A. Yes.
Q. -- Louisville.
A. Yes.
Q. And then you talked about a document, 26228, which was to Mr. Yeaman to Mr. McCormick dated February 28, 1966, which dealt with slanting the information in published reports. Do you recall that?
A. Yes. I recall that, yes.
Q. And then you talked about the fact that reports were published; correct?

A. Yes.
Q. Now you never saw the drafts of any of those published reports; did you?
A. When you say "drafts," you mean the raw -- the raw drafts before final form?
Q. That's correct.
A. No.
Q. You never saw the underlying data; did you?
A. No.
Q. You have no idea how and to what extent any of those documents were slanted or shaped or formed before their final publication; do you?
A. Well I never saw the raw data or the drafts.
Q. So the answer would be -- to my question would be no; correct?
A. Well if your question is indicating that it was slanted -- and I don't know if it was or wasn't -- I don't know if it was slanted or if it was not. I didn't see the original drafts, I saw the final report.
Q. And as you said, when you don't leave a paper trail, it's very difficult to go back and actually get at what happened; isn't it, sir?
A. Well it would make it more difficult, yes.
Q. Much more difficult; doesn't it, sir?

A. I presume. It depends on the paper trail, what you're trying to find. If it's "much more" --
I mean I've got no basis to give a quantitative assessment using the word "much." You're making it a quantitative term. I don't know what to base that on.
Q. Okay. "Much" just doesn't mean anything to you; correct?
A. I think it depends on what you're looking at and what you're trying to find out and how much paper trail is left behind, et cetera.
Q. And if no paper trail is left behind, it's much more difficult than if it's a sparse paper trail; would you agree with that?

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A. If you don't have an original draft to compare with the final, there's no way to make a comparison of the two.
Q. So therefore there's no way that you can testify under oath in this courtroom how or to what degree, if any, any of those published materials were slanted; can you?
A. Well what I can testify to is what the results reported were based on the numbers and the number of occurrences of different measurements that they made and what interpretation they gave to it.

Q. Can you answer my question?
A. Could you repeat your question, please?
Q. Sure.
So therefore, there's no way that you can testify under oath in this courtroom how or to what extent, if any, any of those published reports were slanted; can you?
A. I've got no basis to make a comparison between the two because I didn't see originals and compare it to the final product.
Q. Now with regard to addiction, are you prepared to accept on behalf of Brown & Williamson, under oath, the authoritative statement of the Surgeon Generalr in 1988 that nicotine is addictive?
A. I'm --
My testimony is what it was, which is whether or not you determine it's addictive depends on which definition you use. But we recognize some people have difficulty stopping smoking, some people do not. I think --
Q. That's not what I asked you.
A. -- what I do and do not call addictive depends on the definition you use.
Q. That's not what I asked you. My question is very simple. Are you prepared today under oath to

accept on behalf of Brown & Williamson the authoritative statement of the Surgeon General that cigarette smoking is addictive? "Yes" or "no."
A. Again, just like your last question, I don't think this lends itself to a simple "yes" or "no" answer.
Q. So you can't answer it "yes" or "no;" is that right?
A. If I answer it "yes" or "no," it would -- I would not be able to give my -- the testimony that I would like to give, which is it depends on what your definition is and what you mean by the term "addiction."
Q. And the reason you say that, sir, is because you can't answer "yes" or "no" because of the industry position that was taught to you by Shook, Hardy & Bacon in 1991; correct?
A. No, that's not true.
Q. Well turn to your notes, Exhibit 26173, in

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volume two.
A. And what was the tab number?
Q. 26173 in volume two.
A. Yes. See it.
Q. Those are your notes that you took when you met with Shook, Hardy & Bacon on May 29th, 1991, shortly

after you started with Brown & Williamson; correct?
A. Yes, that's correct.
Q. And if you go to Bates number 941, --
A. Yes.
Q. -- do you see there, sir, that it says, "SGR - 1988 Addiction." Correct?
A. Yes.
Q. And then you have --
And that's the Surgeon General report; correct?
A. Yes.
Q. And then you have below that "Industry Response." Correct?
Correct?
A. Yes.
Q. And then you put down the 41 million people, the same thing that Mr. Bernick directed your attention to earlier this morning; correct?
A. Yes.
Q. And then you go through for the next couple pages dealing with the issue of addiction; correct?
A. Yes.
Q. What you were told at that meeting; correct?
A. These were issues that were discussed in the meeting, that's correct.
Q. And you put down that the Surgeon General's

report is biased; correct?
A. That was one of the things that was discussed at the meeting.
Q. That's what you were told when you met with the lawyers on May 29th, 1991, shortly after you started with Brown & Williamson; correct?
A. That was discussed at the meeting, that's correct.
Q. And can you direct your attention to Exhibit 14303.
A. Same binder?
Q. It would be in volume one, sir.
A. I'm sorry, what was the tab again?
Q. 14303, right at the -- toward the very end.
Did the lawyers tell you in 1991 why that was the industry response?
A. Now 14303?
Q. Yes.
A. Okay. Now your question.
Q. Did the lawyers tell you why that was the industry's response when you met with them in 1991?
A. I don't recall if -- if they did or not. They may have.
Q. This 14303 is a Tobacco Institute memorandum

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dated September 9th, 1980. Do you see that?

A. Yes. Yes.
Q. And the jury and the court has seen this before, sir. If you could direct your attention to page two, do you see what Shook, Hardy told The Tobacco Institute back in 1980, about eleven years before you met with them about addiction? "Shook, Hardy reminds us, I'm told, that the entire matter of addiction is the most potent weapon a prosecuting attorney can have in a lung cancer/cigarette case. We can't defend continued smoking as 'free choice' if the person was 'addicted.'" Do you see that?
A. Yes, I see that.
Q. And Shook, Hardy told you that in 1991; didn't they?
A. No, I don't remember them saying that to me.
Q. No recollection of that at all; is that right, sir?
A. No.
Q. Now you discussed the 1989 Surgeon General report with Mr. Bernick this morning; didn't you?
A. Yes.
Q. You still have it up there with you?
A. I'm sure it's up here somewhere. '89?
Q. 1989. If you can grab it, please.
A. Here it is.

Q. Do you recall a series of questions concerning what people knew concerning what cigarette smoking causes in terms of disease?
A. Yes.
Q. And you're aware, are you not, that in 1985, 99 percent of the smoking-attributable deaths occurred among people who started smoking before -- before the 1964 Surgeon General's opinion?
A. I don't recall that exact statistic.
Q. Let me direct your attention to page the 22 of the Surgeon General's 1989 report.
A. Page 22?
Q. Correct.
A. Is that it on the screen?
Q. That is on the screen.
A. I think it would be easier for me to do that than to find it in here. Some of these pages are upside down.
Q. Direct your attention to number nine. Do you see that?
A. Yes.
Q. "In 1985, 99 percent of smoking-attributable deaths occurred among people who started smoking before the 1964 Surgeon General's report." Do you see that?

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A. Yes.
Q. Were you aware of that when you testified this morning?
A. I didn't remember that exact statistic.
Q. Do you know what percentage of the deaths in 1986 were among people who started smoking before the 1964 Surgeon General's report?
A. No.
Q. And your answer would be no if I asked you that question all the way up to today; wouldn't it, sir?
A. If you asked me what question?
Q. The question how many people who die of smoking-attributable deaths in any given year started smoking before the 1964 Surgeon General's report.
A. No, I don't know that.
Q. You wouldn't know it; would you?
A. No.
Q. How old would a 17-year-old in 1964 be today, sir?
A. 17-year-old?
Q. Fifty-one; correct?
A. I'll take your representation.
Q. 16-year-old would be 52; correct?
A. Yes.
Q. 15-year-old would be 53; correct?

A. Yes.
Q. And you know that the vast majority of people who start smoking start in their teen-age years; don't you?
A. I don't know if it's a vast majority, but I've read statistics that -- that a great number of people do.
Q. Can you direct your attention to page 345 of the 1989 Surgeon General's report. Do you have that?
A. I'm following it on the screen.
Q. Would you look at the paragraph starting with "Another possible reason...." Do you see that?
A. Yes.
Q. "Another possible reason for some smokers' insensitivity to smoking risks is that they have not always been given the full message, or they have been given mixed messages, including prosmoking messages (advertising) from the cigarette industry. Factors that impede public awareness and acceptance of the health hazards of smoking include cigarette advertising and promotion and cigarette companies' public relations and lobbying activities, which are also reviewed in Chapters 6 and 7." Do you see that?
A. Yes, I do.
Q. Do you know how many billions of dollars Brown & Williamson Company has spent on marketing, promotion and advertising?

MR. BERNICK: Objection, Your Honor, it's beyond the scope.
THE COURT: You may answer that if you

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know.
A. No, I don't.
Q. Can you direct your attention to page 479 of the 1989 Surgeon General's report. Do you recall testimony about warnings appearing on cigarette packages?
A. Yes.
Q. You're aware, are you not, that the 1989 Surgeon General reported that in 1981 the FTC staff -- FTC sent a staff report to Congress that concluded that the warning appearing on cigarette packages and in advertisements were no longer effective? Were you aware of that?
A. I -- I may have read this, but I don't -- don't have specific recollection of it at this time, or I didn't until you just refreshed my memory.
Q. You didn't have a recollection of that when you testified this morning?
A. No.
Q. Can you direct your attention to page 596. Do

you have that, sir?
A. I'm following it on the screen.
Q. And the title of that section is "Restriction on Children's Access to Tobacco." Correct?
A. Yes.
Q. And if you direct your attention to the second paragraph, were you aware when you testified this morning that the 1989 Surgeon General's report stated, "As reviewed in Chapter 4, surveys of adolescents indicate that many of those who start to smoke do not understand the nature of tobacco addiction and are unaware of or underestimate important health consequences of smoking. Their decision to smoke is, therefore, not a fully informed choice. The difficulty that teen-agers report in quitting smoking demonstrates that nicotine addiction can quickly become established in children." Do you see that?
A. Yes, I do.
Q. Were you aware of that when you testified this morning?
A. I've read that, yes.
Q. And can you direct your attention to page 608 of the 1989 Surgeon General's report. You talked about the government regulating tobacco products; didn't

you, sir?
A. Yes.
Q. And do you see this section entitled "Federal Regulation of Tobacco Products?"
A. Yes.
Q. Were you aware when you testified this morning that the 1989 Surgeon General reported as follows: "Because the use of tobacco products is hazardous to the health and safety of consumers, the regulation of tobacco products would be consistent with the

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established tradition of health and safety regulation for other consumer products. However, with few exceptions (e.g., see part 1 regarding labeling and advertising regulations), none of the federal agencies charged with health and safety regulation has taken regulatory action against tobacco products, due in part to specific statutory restrictions."

Now do you know how those restrictions got into the laws?

A. No, I don't.

Q. Do you know if the tobacco industry lobbied for those restrictions?

MR. BERNICK: Your Honor, objection, lack of foundation.

THE COURT: Well no, you can answer that,

if you know.

A. No, I don't.

Q. "There are a number of possible reasons for the lack of regulation, including the fact that millions of Americans became addicted to tobacco before its hazards were understood." Do you see that, sir?

A. Yes, I do.

Q. Were you aware of that when you testified this morning?

A. I -- I may --

I've read this, this passage.

Q. Did you have it in mind when you testified this morning?

A. Not specifically, no.

Q. That was not brought to your attention last night or this morning by anybody; was it?

A. No.

Q. Now you talked about Minnesota and surveys in Minnesota. Do you recall that?

A. Yes.

Q. And can you direct your attention --

A. Well actually I'm not sure if that part was allowed in the testimony. Was it?

Q. Do you recall the questions about that?

A. I recall the questions, but I thought it was not

allowed. But I -- I may be wrong.

Q. Some were and some weren't. Isn't that right, sir?

A. I -- yeah. Well I don't know. I really don't know what was allowed and what wasn't.

Q. You just don't recall; is that right?

A. I recall a discussion about it, but I don't understand the rules and procedures enough to know what was actually allowed.

Q. Why don't you direct your attention in volume two to BYB205A. This is a defendants' exhibit.

You've read this --

Oh, I'm sorry. I thought you had it.

A. Could you repeat the tab again?

Q. Sure, BYB -- it's toward the end. Are you in

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volume two?
A. Yeah, but I've got many volumes down here. So it's the cross volume?
Q. Correct.
A. BYB?
Q. Correct. Toward the --
A. Oh, I see it. Yes. And the number?
Q. BYB --
A. BYB --
Q. -- 205A.

A. Okay.
Q. Do you have it?
A. Yes.
Q. Okay. Do you recall that I pointed this out for you on cross-examination?
A. I believe so, yes.
Q. And you read it; correct? I'm not asking if you memorized it, I'm just asking whether you read it, sir.
A. Yes.
Q. And this is a book by Dr. Diehl; correct?
A. Yes.

MR. BERNICK: I object to this line of questioning, Your Honor, A, it goes beyond the scope, B, Your Honor specifically ruled that we could not pursue with this witness the Minnesota polling.

MR. CIRESI: I'm not doing polling, Your Honor.

THE COURT: He hasn't asked any questions on polling. Why don't we see what question he asks so I can rule on it.

BY MR. CIRESI:
Q. Now you know that Dr. Diehl was Dean of the Medical Sciences and Professor of Public Health at the University of Minnesota; correct?

A. Yes.
Q. And that when he retired in 1958, he became the vice-president -- senior vice-president of the American Cancer Society in the title of Research and Medical Affairs and Deputy Executive Vice-president; correct?
A. I don't see where that says that here, but I'm not --

I've got no basis to dispute it.

Q. If you take a look, sir, at the bottom of Roman numeral vii over to the top of Roman numeral viii -- you see that?
A. Yes.
Q. And if you turn to Roman numeral x, do you see in the last paragraph that Dr. Diehl reports that "One major cause of public skepticism about the harmfulness of smoking has been the cleverness of advertising promoting the habit." Do you see that?
A. Yes, I do see that.
Q. And he states, "Another cause has been the

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misleading propoganda of the cigarette industry." Do you see that?
A. Yes, I do.
Q. And do you see a reference to an article that was printed and reprinted from True Magazine entitled

"To Smoke or Not to Smoke?"
A. Yes, I see that.
Q. And do you see that that reprint stated as follows: "Most Medical Authorities Agree -- CIGARETTE LUNG CANCER LINK IS BUNK -- 70,000,000 Americans falsely alarmed." Do you see that?
A. Yes, I see that.
Q. And you see it goes on to state that there were two articles, another one was "To Smoke or Not to Smoke - That Is Still the Question," and that it was determined that both articles were written by the same person under different names? Do you see that?
A. Yes.
Q. And both articles were disguised propoganda for the tobacco industry's context that it has not been proved that cigarette smoking in any way impairs health. Do you see that?
A. Yes, I do.
Q. And if you go on, sir, to the next page in your book, which is Appendix C to Dr. Diehl's book --
A. My next page says 158.
Q. If you go on another page, then, sir. Do you have page -- do you have Appendix C in your book? Should be the third page.
A. Do you have a page number?

Q. Should be the fourth page in -- fifth page in. At the top it says "ATTACKS ON THE EVIDENCE OF SMOKING AND HEALTH, APPENDIX C."
A. Okay. I've got it.
Q. And do you see here that there's a report that Senator Magnuson asked for an inquiry into the story?
A. Yes.
Q. And it states at the bottom, "Dismissing statistical evidence of cancer hazards in smoking cited by the U.S. Surgeon General, the article concluded, 'At the moment all we can say for sure is that the cause of cancer isn't known and there is absolutely no proof that smoking causes human cancer.'" Do you see that?
A. Yes.
Q. And do you see that that article was sent to 600,000 opinion makers around the nation?
A. Yes, I see where it says that.
Q. And are you aware that those opinion makers included physicians, lawyers, school teachers, and many others at that time?
A. No, I don't see where it says that here.
Q. If you go to page 220, I believe you'll see that. "TRUE MAGAZINE AND THE CIGARETTE INDUSTRY," do you see that?

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A. Yes, I see that.
Q. And that's the article that originally -- or appeared in True Magazine. Do you see that, sir?
A. Yes, I do.
Q. And if you go back to page 218, you'll see that the author was an employee of Hill & Knowlton. Right under "'Bunk' says a tabloid." Do you see that, sir?
A. Yes.
Q. "...an employee of Hill & Knowlton Inc., long-time public relations representative for the industry's Tobacco Institute Inc.," do you see that?
A. Yes.
Q. And you'll recall yesterday we looked at two documents, Exhibits 18904 and 18905, that were written by Hill & Knowlton in December of 1953, one reflecting a meeting at the Plaza Hotel and one relating to meetings with research directors of the tobacco companies. Do you recall that?
MR. BERNICK: Your Honor, I object to this line of questioning. This is totally beyond the scope of either -- I assume it's beyond the scope of the redirect examination.
THE COURT: It seems to be --
Well I haven't heard any question with regard to the meetings, so I can't rule on that. Are you

just -- are you objecting to his introductory statement or --
MR. BERNICK: Yeah.
THE COURT: He hasn't asked a question. Maybe we should wait for him to ask a question. Okay?
BY MR. CIRESI:
Q. Do you recall those documents, sir?
A. Yes.
Q. And do you recall that shortly thereafter, the Frank Statement was issued?
A. Yes.
Q. Okay. Now those documents were from Hill & Knowlton; correct, sir?
A. They appear to be.
Q. The same Hill & Knowlton that's referenced here whose author -- or where Stanley Frank, the author of these articles, worked; correct?
A. I assume that's the case.
Q. And can you direct your attention, please, to Exhibit 221 -- I'm sorry, it's page 221 of the same exhibit. And can you look at the last paragraph, reported in Dr. Diehl's book.
"Perhaps because it wraps up in lively journalese the tobacco industry's long time effort to

merchandise doubt, to give cigarette smokers the

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impression that a major scientific controversy rages over whether cigarettes are harmful, that 'only statistics' indict cigarette smoking as an extraordinarily dangerous habit."

And if you go on to the next page: "Controversy there is -- on the one hand is the tobacco industry and now its apologists in True magazine, on the other hand a vast body of scientists and physicians." Do you see that?

A. Yes.

Q. And you recall yesterday that we saw that memorandum of The Tobacco Institute that said there was a 20-year policy, brilliantly conceived and executed to create doubt? Do you remember that?

MR. BERNICK: Your Honor, again I think this goes beyond the scope and opens up another area, again, that was not pursued on redirect examination.

MR. CIRESI: This is directly --

THE COURT: Seems to me this is exactly what you redirected on, counsel.

BY MR. CIRESI:

Q. Do you recall that, sir?

A. Yes.

Q. And that was written to the president of The

Tobacco Institute by the vice-president. Do you remember that?

A. Yes.

Q. And you recall this morning you testified about the Cigarette Labeling and Advertising Act?

A. Yes.

Q. Can you direct your attention to page 158 in Dr. Diehl's book.

A. Okay.

Q. And if you go to the bottom, sir, of that page, you're aware that "The Cigarette Labeling and Advertising Act required that about July 1, 1967 and annually thereafter the Federal Trade Commission report to Congress concerning the effectiveness of the warning label, and upon current practices of cigarette advertising and promotion;" correct?

A. That's what it says, yes.

Q. And it states in the next paragraph that "After an intensive study the Federal Trade Commission made a detailed report to Congress with the following summary and recommendations." Do you see that?

A. Yes.

Q. If we go on to the next page, we see what those are. Number one, "The Commission believes that the warning label on cigarette packages has not succeeded

in overcoming the prevalent attitude toward cigarette smoking created and maintained by the cigarette companies through their advertisements, particularly the barrage of commercials on television, which portray smoking as a harmless and enjoyable social activity that is not habit forming and involves no

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hazards to health."
Were you aware that the FTC made that report to Congress?
A. No, I was not.
Q. If you look at the next paragraph. "It appears to the Commission, from the switch toward filter cigarettes and the popularity of low tar and nicotine cigarettes, that a substantial segment of the public is most concerned about the health hazards of cigarette smoking. Many smokers would like to give up the habit, but don't and won't. Some of these have switched to brands that they believe, often erroneously, to be less hazardous. The Commission favors giving smokers as much information about the risks involved in smoking as is possible and to that end favors mandatory disclosure of tar and nicotine content as measured by a standard test. Until this is done, millions of smokers will continue to be deceived by the false claims of mildness and

misleading portrayals of filters."
Were you aware that the FTC reported that to Congress?
A. I was aware that there was a concern by the FTC about potential health claims made about reduced delivery cigarettes, and that that ultimately -- I -- my understanding is it led to an agreement between the industry and the FTC that the industry would not make health claims, and that it resulted in a requirement of deliveries to be published in -- in connection with advertising. When a product was advertised, you've got to publish what the deliveries were. That part I was aware of. I don't know what the genesis of all that was.
Q. And in 1967, a 17-year-old today would be, what, 48?
A. I guess. I'm not that fast in math.
Q. And let's go on to the next paragraph. "Non-cigarette smokers, particularly the teenagers who constitute an ever-increasing class of potential customers, seem in large part to have been unaffected by the warning on the package alone. The cigarette advertisements, especially on television and radio, that are more frequently viewed and heard by teenagers than other segments of the population, have

been successful in their subtle but effective attempts to persuade teenagers to smoke despite the known health hazards. To protect this group the Commission feels it imperative that adequate health warnings be included in all cigarette advertising."
Do you see that?
A. Yes.
Q. Were you aware of that specific recommendation of the FTC in 1967?
A. Yes.
Q. Were you aware of that when you testified this

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morning?
A. That health warnings were required on cigarette advertising? Yes.
Q. No, this specific recommendation about children, teenagers.
A. Well I didn't know -- I mean I didn't -- I didn't know what the -- all the genesis and origin of that requirement was, and I'm not familiar with this particular report, but I do know that health messages are required on all advertising.
Q. Go on to the next paragraph. "Cigarette smoking today poses a very great but preventable public health menace. It is strongly habituating, and habitual smokers subject themselves to a number of

debilitating illnesses and early death. Despite this, cigarette companies have spent billions of dollars (in 1966 almost $300 million) on inducing the people to take up this habit so dangerous to health. In the interest of fairness to the adults of tomorrow, advertising without an adequate warning should not be permitted to continue. Self-regulation by the industry has proved to be ineffectual." Do you see that, sir?
A. Yes.
Q. Were you aware of that specific language and recommendation?
A. No, I'm not aware of that specific language and recommendation.
Q. Can you go on to the next paragraph. "Cigarette commercials continue to appeal to youth and continue to block out any consciousness of the health hazards. Cigarette advertisements continue to appear on programs watched and heard repeatedly by millions of teenagers. Today, teenagers are constantly exposed to an endless barrage of subtle messages that cigarette smoking increases popularity, makes one more masculine or attractive to the opposite sex, enhances one's social poise, et cetera. To allow the American people, and especially teenagers, the

opportunity to make an informed and deliberate choice of whether or not to start smoking, they must be freed from constant exposure to such one-sided blandishments and told the whole story." Do you see that, sir?
A. Yes, I do.
Q. Were you aware of that before today, that specific statement?
A. Well with all of this, I'm not --
I wasn't aware of these specific words, but I am aware that the health effects have been examined by states and regulatory agencies with a view of what to do about advertising and -- and how to properly manage it, and have in fact implemented what they felt were appropriate in order to deal with it.
And this -- this goes back to 1967?

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Q. Yes.
A. And so I'm aware that generally regulatory agencies, both state and federal, have examined the issue, have considered it, have raised the issues that you're raising here, and have implemented whatever regulatory activities they felt were appropriate to address the issue.
Q. Do you know --
A. But I don't remember these specific words.

Q. Do you know to what degree or magnitude the money spent on promotion and advertising and marketing increased from 1967 to 1994?
MR. BERNICK: Your Honor, I believe this exceeds the scope of direct examination -- redirect examination.
THE COURT: I think it does. Sustained.
BY MR. CIRESI:
Q. Sir, it is the teenagers, 12, 13, 14, 15, 16, 17, 18, that need the most protection; would you agree?
A. I do believe that -- that teenagers should be -- certainly be protected.
Q. And do you know or are you aware that your company, together with the industry, said that for someone to be able to make a rational choice to smoke, they have to be 21 years old? Did you know that?
A. No, I wasn't aware of that.
Q. Never told that; is that right?
A. Pardon?
Q. You were never told that.
A. I was told that our policy is we don't promote cigarettes to anyone less than 21 years old, but I don't know what the genesis of it or specific

statements associated with it.
Q. Did you read Mr. Schindler's testimony in this case?
A. No.
Q. Did you read Mr. Bible's testimony in this case?
A. Only what I read in the paper.
Q. Did you read Mr. Glenn's testimony in this case?
A. No.
Q. Did you read Mr. Merryman's testimony in this case?
A. No. I mean not beyond what was in the press.
Q. Did you read any of the tobacco industry representatives' who have come into this court to testify, --
A. No.
Q. -- any of their testimony?
Not a -- not a line; correct?
A. No.
MR. CIRESI: Thank you. I have no further questions.
MR. BERNICK: I just have just a few

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questions.

RE-REDIRECT EXAMINATION

BY MR. BERNICK:

Q. Dr. Appleton, a number of statements were

made -- were read from the book that was written by Dr. Diehl, BYB000205A, statements made by the tobacco industry regarding its position on causation. Do you recall that?

A. Yes.

Q. Have you seen any evidence from any single Surgeon General's report accepting the position of the tobacco industry on causation?

A. No.

Q. Have you seen any Surgeon General's warning issued since 1966 accepting any of the statements made by the tobacco industry as recited from that Diehl book?

A. No.

Q. Now the Diehl book was written in 1969; is that right?

A. I thought he said '67.

Q. That may be '67. Be absolutely sure. This says copyright 1969.

A. Okay.

Q. Certainly Mr. Diehl -- Dr. Diehl in 1969, he was -- used to be a professor at the University of Minnesota. Are you aware of that?

A. I believe that he said something about that, but it -- it frankly went past me very quickly, so I

didn't have an opportunity to keep track of all that.

Q. Certainly from what Mr. Ciresi has read, do you or do you not believe that Dr. Diehl was accepting anything that was being said by the tobacco industry?

MR. CIRESI: Your Honor, objection, speculation and conjecture.

THE COURT: No, you can answer that.

A. Well it seemed pretty clear to me that his view was very different.

Q. And did anything that you heard read from the Diehl book suggest to you that the state of Minnesota accepted anything that was being said by the tobacco industry?

MR. CIRESI: Once again, Your Honor, objection, speculation.

THE COURT: That is speculation.

MR. BERNICK: I'm sorry?

THE COURT: That is speculation, counsel.

Q. Based on exactly what was read by counsel from the Diehl book, and confining your answer solely to that, did you hear anything read that suggested that the state of Minnesota was buying what the tobacco industry had to say?

MR. CIRESI: Your Honor, it's the same question.

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THE COURT: It's the same question. I don't think the book was a commentary on the knowledge of the state of Minnesota, counsel.
Q. Dr. Appleton, I want you to take a look at Exhibit BYN000058, the 1989 Surgeon General's report.
A. '89?
Q. Yes. And direct your attention to page 516.
A. Can I just look at the screen?
Q. I'm sorry, no.
A. Okay.
Q. I'm not going to be able to do that. If you could page to 516.
A. This is not a real good copy. It's hard for me to tell what the page is.
MR. CIRESI: We'll put it up there for you, doctor.
MR. BERNICK: Do you have 516 there?
(Document displayed on the overhead.)
BY MR. BERNICK:
Q. If you turn down to the bottom of the page under "SUMMARY." You were asked questions about advertising, statements regarding advertising from the Surgeon General's report. Do you see where it says, "There is no scientifically rigorous study available to the public that provides a definitive

answer to the basic question of whether advertising and promotion increase the level of tobacco consumption?" Do you see that statement?
A. Yes, I do.
Q. Is that consistent or inconsistent with your own views on the effect of advertising on tobacco consumption?
MR. CIRESI: Objection, calls for speculation and conjecture. He's not qualified to answer such a statement.
MR. BERNICK: Do you understand -- I'll rephrase the question.
Q. Is that your understanding of what the Surgeon General was saying in 1989?
MR. CIRESI: Well the document speaks for itself, Your Honor.
THE COURT: Well he can answer that one.
A. I'm sorry, could you rephrase the question?
Q. Is that your understanding of the position of the Surgeon General in 1989 on the question of whether advertising has the effect of increasing the consumption of tobacco?
A. Yes, it is.
Q. Finally, you were asked questions about Exhibit 14303, which is a September 9, 1980 memo which talks

about defending smoking as a free choice of a person who was addicted. Do you remember that?

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A. Yes.
Q. When you made your own decision to quit smoking, Dr. Appleton, did it make a difference to you whether you used the label "habit" or used the label "addiction" to talk about smoking?
MR. CIRESI: Totally irrelevant.
THE COURT: Sustained.
MR. BERNICK: No further questions.
THE COURT: You may step down.
(Witness excused.)
THE COURT: Defendants rest? Or --
MR. BERNICK: I'd like to rest, but I don't have -- I don't have that latitude. No, we have another witness.
THE COURT: There's more to come?
MR. BERNICK: More to come.
THE COURT: Okay.
MR. BERNICK: We're calling Dr. Peter Rowell.
We're going to need to set up the equipment, Your Honor, but I think, if it's all right with the court, we can set it up right here.
THE COURT: All right. Go ahead.

MR. BERNICK: Is that all right?
THE COURT: Come up and take the witness stand, please.
(Mr. Rowell assumes the stand.)
THE COURT: Mr. Bernick, I miss the opportunity of seeing your face back there. I wonder if you could move that back just a little bit.
MR. BERNICK: Yeah, I'll try.
THE COURT: Just a foot or so or -- that's fine.
MR. BERNICK: Is that all right?
THE COURT: Yeah.
(Discussion off the record.)
THE CLERK: Dr. Rowell, could you please stand, raise your right hand.
(Witness sworn.)
THE CLERK: Please state your name.
THE WITNESS: Peter Rowell.
THE CLERK: And spell your last name.
THE WITNESS: R-o-w-e-l-l.
THE CLERK: Thank you. Please have a seat.

PETER ROWELL
called as a witness, being first duly sworn, was examined and testified as follows:
DIRECT EXAMINATION
BY MR. BERNICK:
Q. Good afternoon, Dr. Rowell.

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A. Good afternoon.
MR. BERNICK: Good afternoon, ladies and gentlemen.
(Collective "Good afternoon.)
Q. Dr. Rowell, would you please tell us if you have ever testified in a trial before?
A. No, I have not.
THE COURT: Dr. Rowell, there are two switches on that. They both should be on.
THE WITNESS: Should be on.
THE COURT: You're not coming through.
(Discussion off the record.)
BY MR. BERNICK:
Q. Dr. Rowell, could you please tell us for whom you work.
A. I'm a professor in -- at Louisville, at the University of Louisville Medical School.
Q. Okay. And could you tell the jury what your

position is at the University of Louisville Medical School.
A. I'm with the Department of Pharmacology and Toxicology.
Q. And your position there?
A. I'm a professor.
Q. Okay. Could you take a step back for a moment and tell us a little bit about your -- your family background, how you -- where you were born and raised.
A. Okay. I'm from St. Petersburg, Florida, and I was brought up there, went to high school there. And my family, I'm married, married in 1972; I have two children, a 16-year-old daughter and a 14-year-old son.
Q. Okay. Tell us a little bit about where you went to college and -- and the nature of your work in college.
A. Okay. After high school I went to Stetson University in Delant, Florida, and I graduated in 1968, had a bachelor's degree in psychology.
Q. Okay. And after you graduated from Stetson, did you enter into the service?
A. Yes. 1968 was the height of the Viet Nam War, so I was called into the Army and went to Fort Sam

Houston for officer's basic training as a Medical Service Corps officer.
Q. Okay. And what was your assignment after that?
A. My first assignment was at Fort Mead, Maryland, where I was the Headquarters Company commander of a MASH unit, and I was there approximately one year and then was called to Viet Nam, where I guess I was promoted to first lieutenant at that point, and then was the platoon leader for a medical platoon in the 502nd Infantry Batallion of the 101st Airborne Division.
Q. Okay. And what geographically, or in terms of

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where the battle action was, where was your -- where was your assignment in Viet Nam?
A. The infantry batallion was located on a fire base, which is basically the -- it's kind of the most-forward permanent position for American troops, and it was in the north part of South Viet Nam, just a little bit south of Hue, which was the northern-most city and still in South Viet Nam, and the -- the aid -- the batallion aid station and the medics were at that fire base.
Q. And what was the nature of your duties there?
A. Well I kind of ran the medical platoon. We supplied medics to the infantry -- the infantry

companies that were out in the field. We ran a sick call during the day. We ran the batallion aid station, made sure they were supplied with medical drugs and things that they needed.
We didn't really have a hospital there, unless there were casualties right on the fire base. But if -- most of the casualties took place out -- actually out in the -- in the jungle or in the field, and almost always they would be medivacked with helecopters over us back to the hospitals that were back on the coastal area rather out -- rather than in the middle of the country.
Q. Did you --
Before you were discharged, did you receive a promotion, Dr. Rowell?
A. Yes. I was --
Well I was a first lieutenant when I --
Q. Okay. And were you decorated for your -- your service to your country?
A. Well I received the Air Medal for a lot of helicopter medivac service, the Combat Medical Badge, and the Bronze Star.
Q. After leaving the Army --
What year did you leave the Army?
A. Left the Army in 1971.

Q. Okay. Could you tell us what you did next by way of education.
A. Okay. I decided to pursue pharmacology rather than psychology, so I went to the University of Florida Medical School, again in the department of pharmacology and experimental therapeutics there, and stayed there four years and received a Ph.D. degree in pharmacology in 1975.
Q. Okay. Your Ph.D., was it with honors?
A. Yes, Ph.D. with honors.
Q. Could you tell us whether and to what extent your work in graduate school focused on the subject of nicotine and nicotine pharmacology.
A. Well when I started there, the first lab I worked in was an individual who was actually working on nicotine-type analogs that had come from different kinds of snails and some marine animals, trying to

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find some interesting compounds that worked on the neuromuscular junction. But I stayed there about a month and then I moved to a lab of an individual that I ended up working with for the four years who had decided -- or developed some theories on nicotine releasing acetylcholine from nerve endings in the brain. And he, when he was at the University of Iowa, had continued that work. So I picked that up

there and really progressed doing work with nicotine and the acetylcholine system, which is one of the neurotransmitters in the brain. He subsequently left and then became chairman at Texas A&M University.

MR. BERNICK: I don't want to disappoint counsel here by not using the flip chart, so --

MR. CIRESI: I'm sure you won't.

Q. Give me that word again. Acetylcholine?

A. Yes.

Q. A --

A. A-c-e-t-y-l-c-h --

MR. BERNICK: You're not allowed to look.

A. -- o-l-i-n-e.

Q. Close?

A. That's it.

Q. Okay.

MR. CIRESI: This may take a long time, doctor; he writes everything.

(Laughter.)

MR. BERNICK: Just hope everyone gets it down, then I will be happy.

BY MR. BERNICK:

Q. Okay. Tell us what acetylcholine is.

A. Okay. Acetylcholine is what's called a neurotransmitter, and that's a chemical that is

released from a nerve ending, the end of a nerve. When a signal comes down, it releases a chemical -- that's just one of the chemicals -- and then that will stimulate either another nerve usually, if you're in the brain, or if you're in the peripheral nervous system, that's the chemical that actually makes our muscles move, stimulates us whenever we move our arms and legs, that's the chemical that's coming out and making that movement occur, and it's also the chemical that comes out and controls digestion and slows down the heart and pupillary dilation and things like that.

Q. Okay. Are we going to be discussing acetylcholine neurotransmitters using some charts and diagrams here in a minute?

A. Yes.

Q. Okay.

A. This will help explain in -- in a little while.

Q. But just -- just so we get back to where we started here a little bit, when you were doing graduate work on your Ph.D., did your work pertain precisely to this area?

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A. Yes.
Q. Okay.
A. Right in that area.

Q. Now as I understand it, you got your doctorate in 1975. Did you do any post-doctoral work?
A. Yes. From the University of Florida I went to Vanderbilt University in Nashville, where I again was in the department of pharmacology, and was there until 1977 and with -- as a post-doctoral.
Q. Okay. Tell us whether and to what extent your post-doctoral work focused on nicotine.
A. Well I continued to work with nicotine there. In this lab they were interested in trying to discover some mechanism, why cigarette-smoking mothers had lower-birth-weight babies on average than non-smoking mothers, and the hypothesis was that perhaps nicotine was in some way influencing the transport of nutrients from the -- from the placenta -- across the placenta to the fetus, and so we began investigating whether it actually was nicotine that might be contributing to that problem.
Q. Did time come when you went over to the University of Louisville Medical School?
A. Right.
Q. Could you tell us why it is you went to the University of Louisville Medical School?
A. Well in 1977 the University of Louisville pharmacology department recruited a new chair of the

department, his name was William Waddell, and so he was -- he started recruiting some new faculty members. And he had been interested in my work a little bit because the chairman at the University of Florida and he -- had very similar interests to him, they weren't nicotine researchers, but he knew about my degree there and -- and that I had continued on at Vanderbilt. Also, being a nicotine researcher, it turns out that the state of Kentucky has a state-funded agency called the Kentucky Tobacco and Health Research Institute.
Q. Wait. More slowly, please.
A. Oh, sorry.
Q. That's all right.
A. It's called --
Q. Kentucky --
A. -- Kentucky Tobacco and Health Research Institute.
Q. And what is that research institute?
A. That is an institute which taxes cigarettes sold in Kentucky and takes the tax money and applies it to research on tobacco-and-health issues. It's kind of like a little mini NIH, you might say, or a foundation which takes state taxes, in this case, and applies it to medical research. And I was recruited

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there because my work in nicotine and nicotine pharmacology and smoking was thought to be attractive for being able to get some funding for my research from that state agency.

Q. During the first 15 years --

You started at the University of Louisville Medical School in 1977?

A. That's correct.

Q. From 1977 up into the very early part of the 1990s, who is it that provided the bulk of funding for the research that you've done at the University of Kentucky at Louisville?

A. It was that state agency, the Tobacco and Health Research Institute.

Q. During the last five years, has there been any shift in the funding source for your research work?

A. Yes. Most of my work in the last five years has been funded by the National Institutes of Drug Abuse, one of the agencies of the National Institutes of Health.

Q. And is that an agency of the federal government now?

A. Yes. NIH.

Q. Okay. I'd like to talk about some of the publications that you've been involved in. Have you

contributed research to peer-reviewed journals for publication?

A. Yes, I have.

Q. I'd like to focus in particular on research that you've done concerning nicotine and ask you to give us some examples of some of the important research that you have published within the field of nicotine pharmacology.

A. Okay. Well in 1983 or '4 I published an article following up on the ability of nicotine to release acetylcholine, a neurotransmitter, from brain tissue. I had mentioned that my -- the person I worked with at Florida had looked at a little of that in the peripheral nervous system, and there had been no reports that it could really release it from the nerve endings in the brain. And so I took -- and with a rat study -- took parts of the brain tissue out of this place, in this case the cerebral cortex, which is kind of the thinking part or the cognitive part of the brain, and we were able to do a study where just from the nerve endings we showed that nicotine was able to release that neurotransmitter from the brain tissue.

Q. Okay.

A. The importance of that was the fact that perhaps

nicotine --

This is a transmitter involved in learning and memory function, it's the transmitter that's

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decreased in people with Alzheimer's' disease, and that's well known, and the -- and the thinking was that perhaps the negative association between cigarette smokers and their rather less probability of getting Alzheimer's disease, and some other, might be related to nicotine and its ability to release acetylcholine.
Q. Okay. This acetylcholine publication that you've just mentioned in 1984, was it or was it not the first of its kind in the area?
A. Yes, that was the first report of the ability of nicotine to release acetylcholine from nerve endings in the brain.
Q. Okay. I'm going to write down another word, dopamine.
A. Right.
Q. Is that another neurotransmitter?
A. That is indeed another neurotransmitter.
Q. Have you done any pioneering work in the field of nicotine and its effect on dopamine?
A. Yes. I started to shift my emphasis from the learning and memory part of nicotine pharmacology

more to if there was a dependence produced by nicotine. And dopamine is the compound that is thought to be responsible for the pleasure and the reward activity in the brain, and so I wanted to see if the same mechanism that occurred in brain tissue for acetylcholine release would also occur with nicotine and dopamine release. And again, using a different part of the brain, what's really called the pleasure center of the brain. This had been developed back in actually the 1950s in animals where they were -- they would respond on a lever or something to actually get an electrical stimulation in certain very defined parts of the brain which had dopamine in it, which is why dopamine was thought to be this pleasure hormone. And so I reported that in fact nicotine as well could release dopamine in this area of the brain called the nucleus accumbens.
Q. Okay. Dopamine, I think you've told us, is associated with pleasure and reward?
A. Right.
Q. And acetylcholine with learning?
A. Learning, memory function.
Q. Again, are these areas in which you published pioneering, peer-reviewed-quality research?
A. Yes. They were peer reviewed. That -- that

dopamine paper was in the Journal of Neurochemistry, which is one of the major -- I guess probably prestigious -- journals in neurochemistry, and it was the first report of the ability of nicotine to release dopamine from the nerve endings in the brain tissue and specifically in the nucleus accumbens area.
Q. And have there been other publications that you

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have developed based upon your research and submitted for and indeed been accepted by peer-reviewed publications?
A. Yes, there have been quite a few.
Q. Within the field of nicotine.
A. Yes.
Q. Let me ask you: Have you received any personal income from any tobacco company?
A. No, I have not.
Q. What happens to the money that you make in connection with your work here?
A. Well when I started, asked by a law firm to give my views on nicotine pharmacology, I took the money and put it into a research foundation at the University of Louisville. So it doesn't come to me, it goes to a research foundation, University of Louisville Research Foundation it's called.

Q. Okay. And has that remained through today?
A. Yes.
Q. Okay. When was the first time you were asked by a tobacco company to become involved in doing any kind of activity in connection with litigation?
A. Well I've actually never spoken to a tobacco company, but I've spoken to a law firm, and they -- and -- and they asked me about, I guess, the middle or end of 1995 to -- they asked if I would be interested in writing a historical review of nicotine's actions, centering mainly on the brain, but really kind of the fundamental breakthroughs that had happened in nicotine pharmacology from when nicotine was first isolated in the 1850s all the way up to really the present time; what were the fundamental, significant advances that had occurred in nicotine pharmacology.
Q. When was the first contact that you had with a tobacco company lawyer?
A. 1995, I believe it was, sometime.
Q. And by that time how many years had you spent doing research on nicotine pharmacology?
A. Well I guess I started in 1971, so it had been about 24 years or so.
Q. Have you in connection with your work also

reviewed internal documents from tobacco companies?
A. Yes. At the end of 1996, after we had submitted all the work with the historical review, I was unfortunately asked then if we would look at some tobacco documents. And I thought -- when I thought "some," I thought it would be a few tobacco documents. Well delivered to me was several -- I don't know, maybe four or five boxes full of thousands of pages of tobacco documents just before Christmas of 1996, and so I began looking at the tobacco company -- internal tobacco company documents at that time.
Q. I'd like to make a little bit of a checklist of

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the subjects that you're going to be covering with us today. I think you've already referred to nicotine pharmacology.
A. Right.
Q. And what is nicotine pharmacology?
A. Nicotine pharmacology is really how nicotine works in the body, what it does, what systems it works on, and -- and what mechanisms it has, how it affects the physiological processes in the body. Really how it works in the body.
Q. Will you be making a comparison for us between nicotine and other drugs?

A. Yes. I plan on talking about nicotine and how its activity in a number of different areas compares with a number of other drugs, drugs of abuse and -- and some drugs that aren't.
Q. And will you be talking with us about nicotine and smoking behavior?
A. Yes. I'll -- I'll be talking about how nicotine contributes to smoking behavior, how it contributes to the processes of smoking.
Q. Let's begin with nicotine pharmacology.
A. Okay.
Q. Do you have a videotape that you've proposed that would assist you in explaining the pharmacology of nicotine?
A. Yes. I prepared a little tutorial here because it's a complicated subject. And you want me to --
Q. Don't start yet.
A. All right.
MR. BERNICK: This is an exhibit, demonstrative Exhibit 3078, and we offer it for illustrative purposes.
MR. CIRESI: We have objections to this, Your Honor. There should be some foundation laid with regard to some of the underlying support which does not match up. So I'd like some foundation from

this witness.
THE COURT: Can you give us a little background, counsel?
MR. BERNICK: Yes.
BY MR. BERNICK:
Q. Have you prepared a videotape, which is a series of charts and other images that would assist you in explaining nicotine pharmacology?
A. Yes. In -- in these three subject areas, nicotine pharmacology, comparison with other drugs, and -- and nicotine's contribution to smoking, I thought it would be worthwhile to put together a kind of a tutorial. I mean I'm a medical school teacher, so I do this for the medical students and things, and so I went to the graphics art department at the University of Louisville and wrote down kind of a flow chart with little cartoons, you might say, or diagrams, which then were put together in this

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presentation.
MR. BERNICK: Okay. Your Honor, it would be easier --
Your Honor, we're prepared to work through it step by step if that would be easier for the court. There are some references to literature along the way and we would be happy to provide those articles and

introduce them into evidence along the way, but there aren't very many charts that do that. But we'd be happy to do that if it would be easier.
THE COURT: Okay. Are you representing he's read all of these articles?
MR. BERNICK: Yes, absolutely.
MR. CIRESI: It's the articles that --
If they're going to stop when we get there, because there are some issues about some of the articles with regard to what the doctor has depicted vis-a-vis the articles. Also --
THE COURT: Well -- okay.
MR. CIRESI: Also one other issue, and that is the other drugs, which we think is irrelevant.
THE COURT: Well could we look at those in advance so you don't have to interrupt?
MR. CIRESI: That's what I would prefer to do.
THE COURT: You want to look at those before? Otherwise -- or do you want to stop the tape --
MR. BERNICK: Well we can offer in --
THE COURT: -- when you come to an article?
MR. BERNICK: If you like, we can offer in all of the articles. They come in kind of three

packages that pertain to a given subject, and I can offer them all in at once.
THE COURT: Okay. Are these peer-reviewed articles?
MR. BERNICK: Yes, they're all peer-reviewed, I believe.
Dr. Rowell, are they all peer-reviewed articles?
THE WITNESS: Yes. I mean I collected the articles myself, read the articles, put them into the videotape myself.
MR. CIRESI: Your Honor, I have no problem with the articles. I'm not suggesting that. There are some graphs that there are some issues with with regard to how they're depicted vis-a-vis the articles, that's all.
THE COURT: Well okay. I'll let you cross-examine on that.
MR. CIRESI: All right.
THE COURT: Because I don't want to start the tape and then have to stop in the middle of it.
MR. CIRESI: Then our objection, Your Honor, is -- the other one is on the relevance with regard to --

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I think he has Hershey Bars and things like that.

THE COURT: Well I might have a little trouble with Hershey Bars.

Why don't we take a short recess at this time.

MR. CIRESI: Sure.

(Recess taken.)

THE CLERK: All rise. Court is again in session.

(Jury enters the courtroom.)

THE CLERK: Please be seated.

(Side-bar discussion as follows:)

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(Side-bar discussion concluded.)

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(Discussion between the witness and Mr. Bernick.)

MR. BERNICK: Thank you, Your Honor.

BY MR. BERNICK:

Q. Let's begin, Dr. Rowell, in discussing the first topic that's on our chart here, how nicotine works in the human body, by having you describe the basic physiological effects of nicotine.

Do you have a chart which shows the basic physiological effects of nicotine?

A. Yes, I do. I've just put some of the more important physiological effects of nicotine here. The first one that I have here is that it releases adrenalin. That's the hormone that's sometimes referred to as the fight or flight hormone. It's the one that kind of makes your heart speed up and dilates your eyes and makes your hair stand on end, heart beat faster, things like that, blood pressure go up. So it has the effect of releasing adrenalin in the body.

It increases heart rate both through the release of adrenalin and also it has a direct effect on what's called the sympathetic or the fight or flight division of the peripheral nervous system. These are effects on the peripheral nervous system, outside the

brain and spinal cord. Nicotine has been known for a long time to inhibit weight gain in experimental animals as well as human cigarette smokers. Then it can change the EEG patterns in the brain, and so if nicotine is administered, you can measure electrical potential changes, which kind of gets to what it's maybe doing in the central nervous system.

And then as far as its physiological effects, working through acetylcholine again, it has an effect

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on learning/memory, mainly animal studies here where nicotine has been administered directly to animals, maze-performance things.

Q. Let's now talk about the effect on the nervous system in particular.

First of all, can you introduce us to the portions of the nervous system which are affected pharmacologically by nicotine.

A. Okay. Nicotine works on really the whole nervous system, both the central nervous system, which is the brain and spinal cord, and the peripheral nervous system, which is really all the nerve networks that are kind of outside the brain and the spinal cord, going down to the muscles and the organs and glands and the gastrointestinal tract and things like that.

Q. Okay. Central nervous system, the brain and spinal cord.

A. Right.

Q. And the peripheral nervous system is what?

A. The peripheral nervous system are the nerves that come out of this -- normally the spinal cord -- and go out to the different muscles or glands or organs of the body. So those long nerve connections that come out of the central nervous system, that's called the peripheral nervous system, that division outside the central nervous system.

Q. Okay. Let's talk about the structures within the central nervous system which are important to understanding the effects of nicotine.

A. Okay. Well if we're talking about the central nervous system -- this is kind of a poor diagram I put together here of the brain. That's supposed to be a human brain. And what we're going to do is we're going to focus in on the brain and see what's inside.

And really what the brain is made up of is a lot of neurons, so we'll just kind of home in here and come down and see the brain is composed of a complex networks of nerve cells, so really what we have here is this might be a nerve cell, and then it has a long

extension here, and there's a little contact there with another nerve cell, and that might go up to another nerve cell, and here's one coming from this nerve cell. So really the brain is a complex network of nerve cells here.

Q. Okay. Now could you tell us how it is that nerves communicate with one another in carrying out the functions that are required of the human body.

A. Okay. I have a little -- I have a cartoon here of the nerves communicating by electrical and chemical signals. So here's an electrical signal traveling down exciting the next nerve and going down. So we'll watch one down here at the bottom left. Comes along, excites that nerve, then it might

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go along down, excites the next nerve and goes along. So we have really electrical connections that are going along through this whole complex network of nerve cells, and that's how our thinking processes, our emotions and hunger and everything takes place, really, through these electrical and chemical signals.

Q. Okay. Could you tell us a little bit more about what actually takes place when one nerve cell communicates with another.

A. Okay. Well, for example, right here we have one

nerve coming down and exciting that nerve there, and what we'll do is then I'll home in a little bit further, down to that little area of the nerve. So we're going to come in closer here. And this is a cartoon of a connection between this nerve and the second nerve. So here the nerves communicate with each other at the synapse. So this is kind of the upstream nerve, came down that line, and here's what's called the nerve ending or the nerve terminal, and this is the cell body or the big area of the next nerve.

Q. Okay. And then the synapse, what is the synapse on your diagram?

A. Okay. This is the synapse. The synapse is really the space between where one nerve connects to the next nerve. So that's the synapse. And then we can label some more of this diagram here. Inside here are the neurotransmitters. We've talked about two of them, acetylcholine and dopamine, and of course there are several dozen neurotransmitters. These are chemicals that are stored inside the nerve endings of nerves, and their job is to communicate -- this is the chemical part of this. This electrical signal comes down. Here's the chemical part. These chemicals travel across this synapse area and bump

into what are called receptors. These receptors are proteins that exist on the downstream nerve that are really put there to interact with or accept these little neurotransmitter molecules when they bump into these receptors. Some people have made the analogy to a lock and key model where you have these big locks here on the membrane and then the little keys can fit in there. And so the receptors are designed to interact with specific neurotransmitter molecules.

And finally on this diagram I want to point out that there are receptors here also on this nerve -- ending part of the nerve, on the upstream nerve, which can modulate or change up or down the release of neurotransmitters to go across the synaptic cleft here.

Q. Okay.

A. These little led things I haven't talked about yet, but they are little uptake pumps and we'll talk about those.

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Q. Uptake pumps?
A. Yeah, they're actually colloquially called pumps. Scientifically they're called transporters. Like if this was acetylcholine, then this would be a choline transporter. But they take the neurotransmitter, once it's released, and pump it

basically back into the nerve endings so that it can be released again, so that you don't have to make a new molecule every single time you want to get a chemical connection across there.
Q. You testified earlier about work in dopamine and acetylcholine. Are those neurotransmitters?
A. Those are exactly the little chemicals that would be here in either an acetylcholine-containing nerve or a dopamine-containing nerve, and then there are other neurotransmitters as well.
Q. Okay. How does communication then take place? How does -- how does this system function?
A. Okay. In the previous little cartoon we saw some electrical signals coming down the nerve, and then we just saw it exciting this downstream nerve here. Well here we'll see what happens right at the synapse area when the electrical signal moves down. So this is going to start to move here and you'll see an electrical signal come down. This --
When that reaches the ending, a little neurotransmitter molecules move across, and there is an excitement of the post-synaptic nerve. And then this is the neurotransmitters being taken back up by those uptake pumps back in. And we'll go through this one time again. Here's the -- here's the

excitation of the transmitter, and we'll move it along, then the neurotransmitter is released into the synapse, moves across the synapse to interact with these receptors that are designed to be on the downstream side of the neuron, that causes an excitation or an electrical signal in this downstream side of the nerve, which then would travel down, you see the next nerve, and excite these one at a time, and then these neurotransmitter take it out -- get taken back up into the end. And so the electrical signal can jump from one nerve to another through these chemicals at the synapse.
Q. Okay. Now let's talk about those neurotransmitters a little bit more.
A. Okay.
Q. Are there substances, foods, plants, substances in our environment and that we consume which have the effect of releasing neurotransmitters?
A. Yeah. We got -- as this kind of picture just shows -- that many natural substances from food or plant sources can act on these receptors that are on the downstream side of the nerve.
Q. Okay.
A. So --

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Q. Let's talk, for example, about milk. Does milk interact with these receptors and neurotransmitters?
A. Well milk contains a natural substance called tryptophan, and I'll just move right through there, it contains tryptophan.
Q. And what does that do?
A. Okay. Tryptophan would work here on serotonin receptors. Now serotonin is -- it works through serotonin. Serotonin is another neurotransmitter in another type of nerve cell called the serotonin-containing nerve cell. These would be the serotonin receptors. And actually what the tryptophan does --
Q. Hang on a second.
A. Yeah.
Q. If we went back to this first little page here, --
A. Uh-huh.
Q. -- would serotonin --
A. Serotonin, right.
Q. -- be another neurotransmitter?
A. Right. That's --
You'd have to put that one up there as another neurotransmitter in the brain.
Q. Okay. Go ahead now. What does tryptophan do?
A. Okay. It's just an example. Tryptophan comes in and produces more serotonin and causes a bigger

increase in the release. And we'll just move through that one time quickly. Here's some tryptophan coming in. Makes serotonin come out, goes across, bumps into these post-synaptic serotonin receptors on this downstream side of the synapse, down on the next nerve, and then the serotinin would be taken back up by serotonin uptake pumps, back into the nerve ending in order to be released again.
Q. Okay.
A. Okay?
Q. Any other examples of common substances that act through receptors and neurotransmitters?
A. Yes. The next one I have here is -- next one, chocolate, and chocolate contains a compound called theobromine. And theobromine acts through the adenosine receptors, and so those would be adenosine receptors.
Q. Now adenosine, is that another neurotransmitter?
A. Yeah. Here we go again. We've got adenosine inside adenosine-containing nerves. That's why our brain can do lots of fancy things, because we've got a variety of neurotransmitters it can use. And so we have a variety of substances from natural plants or -- usually plants, but sometimes animal sources that I say can act on these different kinds of

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receptors.
And here of course the cocoa bean contains this compound called theobromine, and it can interact here with these adenosine receptors that are really put there to interact with -- to be contacted by the neurotransmitter adenosine. So in this case, rather than coming into this upstream nerve, you'll see here that adenosine can come in directly -- I mean, sorry, theobromine can come in directly from the outside of the synapse when it's eaten or taken it in and can act on these adenosine receptors on the post-synaptic side, and we see this starts to cause an increase there in the electrical signal in the downstream nerve, and then adenosine comes in and it's just metabolized in the body. Usually --
Q. So in that --
In that case, theobromine goes directly to the receptors.
A. Right. It kind of by-passes the nerve and works directly on the receptors.
Q. What about coffee?
A. Okay. Coffee, as we know, contains the compound caffeine, and caffeine then can work also through the adenosine receptors. So caffeine and theobromine work on the same adenosine receptors. It's really

exactly the same mechanism, so I'll just run through it once. Here's some caffeine molecules coming in. It's a stronger agent than theobromine. It can do more and in fact works on these adenosine receptors. We get the stimulation or the electrical signal, and it also is metabolized, usually in the -- mainly in the liver. So it comes into the synapse again and works that way.
Q. Okay. What about nicotine now?
A. Okay. Cigarettes contain nicotine. Of course nicotine is coming from the tobacco plant, which is another natural plant source of this compound. And nicotine, as we talked about a little bit earlier, works through the acetylcholine receptors. So here we have the nerve terminal -- or this nerve being a acetylcholine-containing nerve, and this is the first neurotransmitter that we put up on the flip chart, and nicotine comes in and works on these acetylcholine receptors, sometimes actually called nicotinic receptors. And nicotine will come in, bind to these acetylcholine receptors, cause a stimulation, and then nicotine will be removed from the synapse and metabolized as well. So --
Q. That's a situation where the nicotine interacts directly with certain receptors?

A. Right. Nicotine --
Q. Those are the same -- the same receptors that would be able to be receptors to acetylcholine as a transmitter.
A. Right. That's how nicotine works in the body,

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it acts through those acetylcholine receptors.
Q. Okay. Now we talked a little bit about neurotransmitters as we've gone along here, and I started to make kind of a list. But do you have a fuller list of the kinds of neurotransmitters which will be important in comparing the effects of nicotine with other drugs?
A. Yes. I've listed a number of neurotransmitters here. The receptors, first of all, exist for the chemical that occurs naturally in the body. So they're not there to work on the drugs, I mean our body doesn't make these receptors in case some day we'll come along and take some drug. The receptors are there to work with these normal neurotransmitters. They're inside the nerves. And it just so happens that some substances in the plant world or the animal world can also act on these same receptors. Usually the -- usually the plants or animals have developed some kind of a defense mechanism or predatory mechanism to use chemicals to

interact with these receptors. So what are the neurotransmitters? Here are some of the neurotransmitters in the brain, and they include, first of all, acetylcholine.

And the other thing I have up here is kind of a general function of what this neurotransmitter would do in the brain, and we've already talked a little bit about learning and memory with acetylcholine.

Serotonin is another neurotransmitter we talked about early on. It was the one that tryptophan works through, and it has to do with mood or sleep. Tryptophan -- well I mentioned it with milk, a lot of people think if you take warm milk before you go to bed, you get a little more tryptophan and that kind of makes you drowsy. And so there's a mechanism there. It's a rather mild effect. Norepinephrine is an alertness compound in the brain; it has the ability to cause kind of an excitation effect or an alerting effect. Glutamate is also an exciting type transmitter. It's -- a lot of people know that from MSG or monosodium glutamate that used to be used in a lot of food sources, and it was actually taken out of baby foods and things a while ago because it caused this excitation type effect on the brain. A lot of people say if they go to Chinese restaurants, they

get a lot of MSG or monosodium glutamate in their food, they get -- get real excited. It's a food flavoring agent.

GABA, it's real name is gamma amino buteric acid, but everybody just calls it GABA, that's kind of an inhibitory neurotransmitter, so that depresses nerve activity in the brain.

Adenosine we talked about with caffeine and we talked about it with theobromine, that's kind of a synaptic modulator. It's kind of hard to describe,

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but it works on a lot of nerve endings to change the release of some of these other neurotransmitters.

And finally dopamine, the other one I talked about earlier that was on the flip chart, that's normally associated with pleasure and reward centers in the brain. It's also involved with motor activity and is the one that people get depressed when they get Parkinson's disease and they can't move very well. The movie Awakenings was actually about discovering a drug, L-dopa, which could increase dopamine in the brain. So it's a motor and kind of a pleasure reward neurotransmitter.

Q. Okay. In terms of overlap between some of the substances that you talked about; that is, overlap in the transmitters that are affected, could you talk to

us a little bit about the overlap between nicotine and caffeine, as an example.

A. Yeah. Here we have --

A variety of neurotransmitters are affected by nicotine and caffeine. So nicotine, rather than really focusing in on one kind of neurotransmitter to increase, it can actually increase the release of acetylcholine, serotinin, norepinephrine, glutamate, you have a lot of those we had on the previous slide. So like caffeine, nicotine is really thought to be a kind of a synaptic modulator that can increase the release of a variety of neurotransmitters. Again it's working through a normal acetylcholine system where you have a acetylcholine -- acetylcholine would normally be doing this. But acetylcholine --

Q. Dr. Rowell --

A. Oh, I'm sorry.

Q. The court reporter here is probably going to be going crazy here in a minute. Just keep a little bit more slow so that --

A. Okay.

Q. -- he can get it all down.

A. Okay.

MR. CIRESI: Maybe counsel could start writing again, Your Honor.

THE COURT: That would slow things down.

MR. BERNICK: Well if Mr. Ciresi promises to -- maybe he'll let me introduce one of these as an exhibit.

(Laughter.)

MR. CIRESI: No, we won't go that far.

MR. BERNICK: Oh, no. No chance. Okay.

A. Okay. Basically what this is showing is only that with nicotine and caffeine, they kind of modulate or affect the release of a variety of these neurotransmitters we talked about. So working through the acetylcholine receptors, they can actually increase the release of acetylcholine, serotonin, norepinephrine, some of these others, rather than working directly on, let's say, the

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dopamine or the glutamate neurotransmitter.
Q. Okay. Are these all neurotransmitters that one way or another are affected by both nicotine and caffeine?
A. Yes, uh-huh.
Q. Okay. Now I want to move with this backdrop to the second topic that I have already written down, --
A. Okay.
Q. -- which is to compare nicotine with other drugs.

Is there a particular neurotransmitter that is useful for you, as a specialist in nicotine pharmacology, is there a particular neurotransmitter that can be used to compare nicotine with other drugs?
A. Well the one that's been centered on mostly, as far as nicotine's contribution to cigarette smoking, is the dopamine neurotransmitter. Dopamine is the one that's involved in pleasure and reward that we talked about, and it's been found that a lot of drugs that tend to have reinforcing properties or pleasurable properties work on this dopamine transmitter, and that's the one that I kind of shifted my emphasis to in the mid-'80s, to look at dopamine release in an area of the brain called the nucleus accumbens or the pleasure center.
Q. You used the word "reinforcement" --
A. Uh-huh.
Q. -- in talking about dopamine. What does "reinforcement" mean?
A. "Reinforcement" means that it -- it stimulates that kind of behavior. It -- it's a pleasurable activity. It's usually applied more towards an animal because you can't really tell whether an animal is experiencing pleasure or not. That's kind

of a subjective human-type thing. So when you notice that an animal likes something, rather than call it a pleasure, pleasurable effect, we say it's reinforcing to that animal. So it is a reinforcement-type mechanism.
Q. We say there's a tendency on exposure to that material to want to repeat the exposure?
A. Right. They probably like it, but we can't tell, so we say it's reinforcing.
Q. All you can do is observe their behavior.
A. Exactly. We can measure how their behavior changes.
Q. Okay. Could you explain a little bit about dopamine and the interaction of dopamine in your little diagram of how the nerve functions.
A. Okay. If we --
If we just go to a dopamine synapse now -- again this is the synapse area between an upstream nerve and a downstream nerve. So this is a dopamine nerve ending and a nerve terminal, so means it's going to

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contain dopamine as a neurotransmitter. These receptors on the downstream side of the synapse will be dopamine receptors.
Q. You mean there are different receptors for different kinds of neurotransmitters?

A. Right. Every neurotransmitter would generally have its own receptor. That's probably so that the brain doesn't get mixed up because a lot of these nerve endings are very close to each other. So when dopamine comes out, it would not act on a acetylcholine receptor, for example. If this was a acetylcholine receptor, there would be no effect because dompamine doesn't fit into that receptor. So a dopamine nerve terminal or nerve ending here is going to really be right across the synapse from dopamine receptors that are put there by the body, you might say, to be able to be stimulated by the dopamine that's released.
Q. Now you got another word there, which is "dependence."
A. Okay.
Q. In what way are you using the term "dependence" on that chart?
A. When I say linked to dependence, dependence potential is really the -- related to the -- sometimes people have called it the addiction of a drug. Addiction and dependence sometimes are used interchangely more in kind of a coloquial sense, but it's the ability to, again, reinforce behavior or to have withdrawal symptoms if it's -- if it's removed,

so dependence on a drug or on a behavior sometimes.
Q. So when you say the neurotransmitter dopamine has been linked to dependence, what does that mean?
A. That means that with drugs of -- that have been shown to be dependence-producing drugs, it looks like the neurotransmitter dopamine is kind of a common pathway for many of these agents. So the opiates, the amphetamines, morphine, all these drugs early on were shown to affect this dopamine system in the brain, in this pleasure center of the brain, so that it's increases in dopamine levels in the nucleus accumbens or in the pleasure center that -- that's probably reinforcing and leads to this dependence potential.
Q. And this again is based upon laboratory experiments with animals?
A. Yes.
Q. Okay. And in those experiments are --
Is it just a question of seeing or is there data that's taken?
A. No, no, there's -- there's data that goes through.
Q. How does this system function? What -- can you set this one in motion for us a little bit?
A. Okay, sure. Here we have dopamine, and what

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I'll do is I'll have some drugs that kind of interact with the dopamine system. I talked about nicotine being a kind of synaptic modulator, and nicotine can increase dopamine levels through acetylcholine receptors.

So remember I mentioned a little bit earlier that these nerve endings have acetylcholine receptors on them, which is the way some of these drugs work as neuromodulators. So here is nicotine down here, and nicotine can come in and stimulate these presynaptic receptors. Now when a nerve impulse comes down, we can get a greater release of dopamine into the synapse. So here's dopamine in the synapse, now it's going to come to this downstream side of the receptors, cause an electrical signal, and then dopamine -- this is dopamine, remember, in the synapse -- dopamine will be taken back up by these uptake pumps that were labeled on the last picture, back into the nerve terminal. So here nicotine -- this is really showing how nicotine can increase dopamine release in the pleasure centers of the brain.

Q. So nicotine comes along, it acts on the acetylcholine receptors on the left side.

A. Right, to the right here.

Q. Okay.

A. Because nicotine really always acts on these acetylcholine or acetylcholine receptors.

Q. The nerve then releases dopamine, which goes across and stimulates those special dopamine receptors?

A. Right.

Q. Is that the currently-accepted view of how nicotine acts pharmacologically to increase dopamine levels?

A. Yes. Dopamine --

Nicotine can work on these acetylcholine receptors here on the nerve ending to stimulate the dopamine release. There's also a possibility that some of these nicotinic receptors or acetylcholine-type receptors exist up on the big part of the cell body, we had kind of early in the picture, and then when they're stimulated they can actually cause an increase in the electrical potential to come down, this electrical thing, and also increase -- cause a neurotransmitter release. So that's really not worked out yet as far as whether it's right at -- right at the synapse or right at the -- at the -- up -- up on this same dopamine nerve.

Q. Now Dr. Rowell, what role, if any, have you

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played in developing the pioneering science on the subject that we've just now covered?
A. Well the study that I talked about with using nicotine in rat studies --
Unforntunately you can't do these neurotransmitter-release studies in the brain because human -- in humans, because humans, you can't really measure the dopamine in -- in the brain system because you can't take the brain parts out. So with animal studies, we've been able to show that nicotine is able to release dopamine right at the synapse area and measure the differences between having nicotine and not having nicotine in the brain system. We put nicotine into the system for a certain amount of time and we can see increase in dopamine release.
Q. Okay. I want to direct your attention to Exhibit GK000129, which is tab one of your volume.
A. Okay.
Q. And ask -- I'm sorry?
Do you have that there in front of you?
A. I have that.
Q. And ask you whether that's a publication in the Journal of Neurochemistry where you were the principal author?

A. Yes.
Q. And is this a piece of research that is considered a reliable authority within your field?
A. Yes. That's, as it says here, the official Journal of the International Society for Neurochemistry.
Q. And have you relied on the work that's set forth here in connection with offering opinions in this case?
A. Yes, I have.
MR. BERNICK: We offer it as a learned treatise.
MR. CIRESI: No objection, Your Honor.
THE COURT: The court will receive GK000129.
BY MR. BERNICK:
Q. That's the title page there?
A. That's the one.
Q. Or the cover.
A. That's the cover of the journal.
Q. And do we have here the title page?
A. Yes. That's the first page of that, that article.
Q. And these are all people who worked with you at the University of Louisville School of Medicine?

A. Yes, that's right.
Q. And is this actually the article that you talked about when we talked about some of your background in this area?
A. That's the article, yes.
Q. Okay. I want to direct your attention to the

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discussion section which appears at page 1452.
A. Okay.
Q. It says that "The results of this study demonstrate that nicotine has the capacity to release dopamine from the nucleus accumbens of the mesolimbic system as has been well-documented in the striatum and the hypothalamus." What is the nucleus accumbens?
A. Okay. That is what I talked about before as kind of the pleasure center of the brain. It's the nerve endings that release dopamine that are thought to be responsible for stimulating good feelings, how -- how good you feel and how much pleasure you get and the reinforcing effects in animals.
Q. So that's the reward center within the brain?
A. That's the reward center in the brain.
Q. Could you kind of point out roughly where it's located in your head?
A. Okay. It's kind of -- it's kind of in the front

of the brain, down deep into the midbrain. And these dopamine nerves come from the back of the brain in another area called the ventral tegmental area -- it doesn't really matter -- but they project up towards the front of the brain down towards the base there in that small area called the nucleus accumbens.
Q. It says, "This effect of nicotine is dose-dependent and is produced at submicromolar concentrations of the drug." It goes on to say, "This is an important observation because it is necessary to show that nicotine effects are produced at concentrations similar to those found in the blood of cigarette smokers."
A. Right.
Q. Do you see that?
A. Right.
Q. Does that tell us the relevance of the work that you were doing on dopamine to the issue of the effects of nicotine in cigarette smokers?
A. Yes. It wouldn't be very important to find that nicotine can do a -- do an effect or have an effect if it was many times higher concentration than would ever be experienced by a smoker. You wouldn't be able to relate this to -- the relevance of this finding in the human population. And so when we

tried different doses of nicotine to stimulate the release, we found that it could stimulate the release at concentrations that had been found in the blood of cigarette smokers by other people, not by us.
Q. The jury at this trial has heard prior testimony about research done by Dr. Armitage and research done by Dr. Russell. Are those both people who have done work in this field previously?
A. Yes.
Q. Those are the same people that are cited here?
A. Yes. I don't know what -- what the jury's

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heard, but I guess they're the same people, yeah.
Q. An M. H. Russell?
A. M. H. --
Yeah, Dr. Russell and Dr. Armitage.
Q. Directing your attention to page 1451, and in particular up to the chart that appears at the -- at the top of the page, what does this chart show regarding nicotine-induced dopamine release?
A. Okay. That's the concentration curve, or you might say as you change the concentration along the bottom, you get increasing amounts of dopamine release. That -- what that is, it says tritium dopamine because we track the dopamine by putting a little radioactive tag on it --

Q. Okay.
A. -- so we can measure it. So that's just the concentration/effect relationship.
Q. Okay. This measurement of dopamine is along the upper part of the graph?
A. That's right.
Q. Now are these measurements measurements that are made scientifically and quantitatively using laboratory procedures?
A. Yes, they are.
THE COURT: Counsel.
MR. BERNICK: Yes. This would be a fine time to break.
THE COURT: Okay. We'll recess and reconvene tomorrow morning at 9:30.
THE CLERK: Court stands in recess, to reconvene tomorrow morning at 9:30.
(Recess taken.)

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